PENTAX™

OWNER'S MANUAL

HALOGEN LIGHT SOURCE

LH-150PC

INTENDED USE:

This electro-medical device (light source) is intended to be used as a source of illumination for endoscopes.
Together, this light source and endoscope may provide optical visualization of, and/or therapeutic access to, various body cavities, organs and canals. Do NOT use this device for any purpose other than that for which it has been designed.
This device should only be used by physicians who have thoroughly studied all the characteristics of this device and who are familiar with the proper techniques of endoscopy.

IMPORTANT:

Read this manual before operating and save this book for future reference.
This manual describes the recommended procedures for inspecting and preparing the Halogen Light Source prior to its use and the care and maintenance after its use. It does not describe how an actual procedure is to be performed, nor does it attempt to teach the beginner the proper technique or any medical aspects regarding the use of the equipment.
Failure to follow the instructions in this manual may result in damage to and/or malfunction of the equipment.
If you have any questions regarding any of the information in this manual or concerns pertaining to the safety and/or use of this equipment, please contact your local PENTAX representative.

Conventions

Throughout this manual, the following conventions will be used to indicate a potentially hazardous situation which, if not avoided;

⚠ WARNING : could result in death or serious injury.

CAUTION : may result in minor or moderate injury or property-damage.

NOTE : may result in property-damage. Also, advises owner/operator about important information on the use of this equipment.

FOR USA PRESCRIPTION STATEMENT:

Federal (USA) law restricts this device to sale by or on the order of a physician or other appropriately licensed medical professional.

Symbol for “MANUFACTURER”

Symbol for “DATE OF MANUFACTURE”

EC REP Symbol for “AUTHORISED REPRESENTATIVE”

CE

このCEマーキングはEC指令への適合宣言マークです。
The CE marking assures that this product complies with the requirements of the EC directive for safety.
Das CE Zeichen garantiert, daß dieses Produkt die in der EU erforderlichen Sicherheitsbestimmungen erfüllt.
Le logo CE certifie que ce produit est conforme aux normes de sécurité prévues par la Communauté Européenne.
Il marchio CE assicura che questo prodotto è conforme alle direttive CE relative alla sicurezza.
La marca CE asegura que este producto cumple todas las directivas de seguridad de la CE.
CE 标志意味着保证该类产品遵从欧洲共同体安全法规。

TABLE OF CONTENTS

	SYMBOLS ON MARKING	SYMBOLES UTILISES
	Alternating current	Courant alternatif
	Type BF Applied Part (Safety degree specified by IEC 60601-1)	Élément Type BF (Niveau de sécurité spécifié par la norme IEC 60601-1)
	OFF (Power: disconnection from mains)	“OFF” (Alimentation: déconnectée du secteur)
	ON (Power : connection to the mains)	“ON” (Alimentation:connectée du secteur)
	Attention, consult owner’s manual	Attention: consulter le manuel d’utilisation
	Protective earth (ground)	Mise à la terre de protection
	can be hot and should not be touched without taking care.	pourrai etre tres chaud et ne devrai pas etre touche sans prendre des precautions.

1. SAFETY PRECAUTIONS

The following precautions should always be exercised with the use of all electro-medical equipment to ensure safety to all involved parties - user(s), patient(s), etc. Please read carefully and follow this owner's manual.

1-1. TRAINING

1. This equipment should only be used under the supervision of a trained physician in a medical facility. Do NOT use in other locations or for any purposes other than the intended application.

1-2. INSTALLATION

1. This equipment should NEVER be installed or used in areas where the unit could get wet or be exposed to any environmental conditions such as high temperature, humidity, direct sunlight, dust, salt, etc., which could adversely affect the equipment.
2. This equipment should NEVER be installed or used in the presence of flammable or explosive gases or chemicals.
3. This equipment should NEVER be installed, used or transported in an inclined position nor should it be subjected to impact or vibration.
4. For safety reasons, this equipment must be properly grounded. This equipment should be connected to a three (3) prong hospital grade receptacle in U.S.A. or Canada.
5. Ensure that all power requirements are met and conform to those specified on the rating plate located on the rear panel.
6. Do NOT block the air intake vent of this equipment.
7. Do NOT allow the power cord to become twisted, crushed or pulled taut.
8. When using an isolation transformer for any ancillary equipment, ensure the power requirements of the devices do not exceed the capacity of the isolation transformer. For further information, contact your local PENTAX distributor.

1-3. PRIOR TO USE

1. Confirm that this equipment functions properly and check the operation of all switches, indicators, etc.
2. To prevent electrical shock when used with endoscopes, this equipment is insulated type BF electro-medical equipment.
   Do NOT allow it to be grounded to other electrical devices being used on the patient. Rubber gloves should always be worn to prevent grounding through user(s).
3. Confirm that other devices used in conjunction with this equipment function properly and that these other devices will not adversely affect the operation or safety of this equipment. If any component of the endoscopic system is not properly functioning, the procedure should not be performed.
4. Check and confirm that all cords or cables are connected correctly and securely.

1-4. DURING USE

1. To prevent electric shock, the endoscope and/or any other ancillary device should NEVER be applied directly to the heart.
2. Make sure that no contact is made between the patient and this equipment.
3. The light emitted by the halogen lamp is extremely intense. Avoid looking directly at the light exiting the endoscope and/or this equipment.
4. To protect the users eyes and avoid risk of thermal injury during an endoscopic examination, use only the minimum amount of brightness required.
5. During clinical procedures, avoid unnecessary prolonged use which could compromise patient/user safety.
6. Continually monitor this equipment and the patient for any signs of irregularities.
7. In the event that some type of irregularity is noted to the patient or this equipment, take the appropriate action to ensure patient safety.
8. If the operation of any of the components of the endoscopic system fails during the procedure and the visualization of the procedure is lost or compromised, place the endoscope in the neutral position and slowly withdraw the endoscope.
9. This equipment should only be used according to the instruction and operating conditions described in this manual. Failure to do so could result in compromised safety, equipment malfunction or instrument damage.

1-5. AFTER USE

1. Refer to the operating instructions supplied with all the components of the endoscopic system to establish the right order which component should be turned off in due course. Some peripheral devices may have to be turned off first to avoid compromising their operation.
2. Wipe all surfaces clean with gauze slightly dampened with alcohol.
3. Be sure connector interfaces and ventilation ports are not allowed to become wet or splashed with liquids.

1-6. STORAGE

1. This equipment should NEVER be stored in areas where the unit could get wet or be exposed to any environmental conditions such as high temperature, humidity, direct sunlight, dust, salt, etc., which could adversely affect the equipment.
2. This equipment should NEVER be stored in the presence of flammable or explosive gases or chemicals.
3. This equipment should NEVER be stored or transported in an inclined position, nor should it be subjected to impact or vibration.
4. Cords, accessories, etc., should be cleaned and neatly stored.
5. This equipment should be maintained in a clean condition during storage and be ready for subsequent use.

1-7. SERVICE

1. Alterations/modifications to the equipment should NEVER be made.
2. When replacing fuses, lamps, etc., use only the components recommended by PENTAX.

1-8. MAINTENANCE

1. Periodically this equipment and any applicable accessories should be inspected for operation and safety.

1-9. DISPOSAL

1. The equipment should be returned for disposal to PENTAX. Contact your local PENTAX representative or service facility.

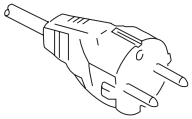
An information on Disposal for users in the European Union

This product is a medical device. In accordance with European Directive 2002/96/EC on Waste Electrical and Electronic Equipment, this symbol indicates that the product must not be disposed of as unsorted waste, but should be collected separately. Contact your local PENTAX distributor for correct disposal and recycling.

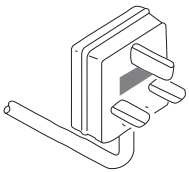
By disposing of this product correctly you will help ensure that the waste undergoes the necessary treatment, recovery and recycling and thus prevent potential negative effects on the environment and human health which could otherwise arise due to inappropriate waste handling.

POWER REQUIREMENTS

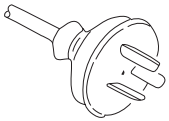
Check the standard power plug configurations that are used in your country. If the appropriate power cord is not included in your product, notify your local PENTAX distributor.



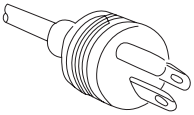
Continental Europe
(Use a SEV approved power plug for use in Switzerland)



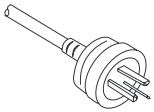
U.K.



Australia
and
New Zealand



U.S.A. and
Canada
(Hospital Grade)



China

1. PRECAUTIONS DE SECURITE-IMPORTANT

Les précautions suivantes doivent toujours être obeervées lors de l'utilisation de tout matériel médical électrique susceptible d'être utilisé avec cet appareil, pour assurer à toutes les personnes concernées (utilisateus, patients, etc...) une sécurité maximale.

Veuillez lire et suivre attentivement les recommandations du manuel d'utilisation.

1-1. FORMATION

1. L'appareil ne doit être utilisé que sous la surveillance d'un médecin expérimenté, dans un établissement médical. Ne pas utiliser dans un autre endroit ou pour toute autre application pour laquelle il n'est pas prévu.

1-2. INSTALLATION

1. L'appareil ne doit JAMAIS être piecé ou utilisé dans un endroit où il serait mouillé, ou exposé à l'humidité, à une température élevée, au la lumière solaire directe, au la poussière, au sel, etc., qui pourraient l'endommager.
2. L'appareil ne doit JAMAIS être placé ou utilisé en présence de gaz ou de produits chimiques inflammables ou explosifs.
3. L'appareil ne doit JAMAIS être placé, utilisé ou transporté en position inclinée, ni être soumis à des chocs ou des vibrations.
4. Pour des raisons de sécurité, l'appareil doit être correctement relié à la terre (cet appareil doit être branché dans une prise secteur 3 broches aux normes Hôpital aux U.S.A. et au Canada).
5. Assurez-vous que les spécifications électriques de la prise secteur sont conformes à celles indiquées à l'arrière de l'appareil.
6. Ne pas obturer les orifices de ventilation de l'appareil.
7. Ne pas écraser, plier ou tendre le cordon secteur.
8. Dans le cas ou un transformateur d'isolement est utilisé pour le matériel périphérique, vérifier que la puissance totale de l'installation ne dépasse pas la capacité du transformateur. Pour de plus amples informations, contacter votre distributeur PENTAX.

1-3. AVANT UTILISATION

1. Vérifier le fonctionnement de l'appareil et de ses interrupteurs, afficheurs, voyants, etc...
2. Pour prévenir les risques de chocs électriques lorsqu'il est utilisé avec des endoscopes, cet appareil doit être installé comme "Matériel électrique médical type BF". Ne pas le relier aux autres appareils électriques utilisés pour le même patient. Les utilisateurs doivent s'isoler électriquement en portant des gants de caoutchouc.
3. Vérifier le fonctionnement des périphériques utilisés avec l'appareil et s'assurer qu'ils n'en perturbent pas le fonctionnement et la sécurité. Si l'une des composantes du système endoscopique ne fonctionne pas correctement, interrompre l'utilisation.
4. Vérifier le branchement des différents câbles de liasions (vidéo, secteur, contrôle, etc...).

1-4. PENDANT L'UTILISATION

1. Pour éviter les risques de choc électrique, l'endoscope et/ou tout autre périphérique utilisé conjointement avec l'appareil ne doivent JAMAIS être placés directement sur le coeur.
2. Ne pas mettre le patient en contact avec l'appareil.
3. Eviter de regarder directement la lumière sortant de l'endoscope et/ou de l'appareil du fait de la forte luminosité émise par la lampe au xénon et la diode laser violette.
4. Pour protéger l'utilisateur et éviter toute blessure thermique pendant l'examen, régler la luminosité au minimum nécessaire.
5. Eviter une utilisation prologée de l'appareil si elle n'est pas indispensable, pour ne pas compromettre la sécurité du patient et de l'utilisateur.
6. Surveiller en permanence l'appareil et le patient pour prévenir tout signe de dysfonctionnement.
7. En cas de problème avec le patient ou l'appareil, prendre toutes les mesures nécessaires pour préserver la sécurité du patient.
8. Si un problème de fonctionnement survient sur l'un des appareils du système endoscopique et que l'image est interrompue ou aitérée, placer l'endoscope en position neutre et le retirer doucement.
9. Cet appareil doit toujours être utilisé selon les instructions et conditions de fonctionnement décrites dans ce manuel. Ne pas les suivre peut compromettre la sécurité, le fonctionnement du matériel, ou endommager l'appareil.

1-5. APRES UTILISATION

1. Veuillez vous référer aux instructions fournles avec chaque composante du système endoscopique afin d'éteindre les composantes dens l'ordre adéquat. Certains périphériques peuvent davoir être étaints d'abord pour ne pas compromettre leur fonctionnement.
2. Essuyer les appareils avec une compresse légèrement imbibée d'alcool.
3. Vérifier que les connecteurs et les orifices de ventilation sont à l'abris des projections de liquides.

1-6. STOCKAGE

1. L'appareil ne doit JAMAIS être rangé à l'humidité, à température élevée, à la lumière solaire directe, la poussière, le sel, etc., qui pourraient l'endommager.
2. L'appareil ne doit JAMAIS être rangé en présence de gaz ou de produits chimiques explosifs.
3. L'appareil ne doit JAMAIS être rangé en position inclinée ni être soumise à des chocs ou des vibrations.
4. Les accessoires et les câbles doivent être nettoyés et rangés correctement.
5. L'appareil doit être maintenu en parfait état de propreté durant le stockage, et tenu prêt pour l'utilisation suivante.

1-7. SERVICE

1. Ne JAMAIS modifier ou altérer l'appareil.
2. En cas de remplacement de fusibles, lampes, etc..., n'utiliser que des plèces recommandées par PENTAX.

1-8. MAINTENANCE

Périodiquement, cet appareil et tous les périphériques associés doivent être vérifiés en fonctionnement et en sécurité.

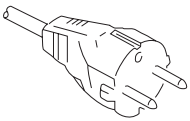
1-9. ÉLIMINATION

Ce matériel doit être retourné à PENTAX pour élimination.
Contacter votre représentant ou votre service après-vente PENTAX local.

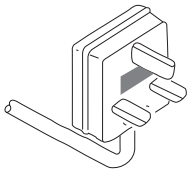
Information concernant l'élimination des produits dans l'Union européenne.
Ce produit est un dispositif médical. En conformité avec la Directive européenne 2002/96/CE relative aux déchets d'équipements électriques et électroniques, ce symbole indique que le produit ne doit pas être éliminé comme un déchet non trié, mais qu'il doit faire l'objet d'une collecte sélective. Contactez votre distributeur PENTAX local pour avoir des informations concernant la procédure correcte d'élimination et de recyclage.
En éliminant ce produit correctement, vous contribuerez à garantir que ce déchet est soumis au traitement, à la valorisation et au recyclage nécessaires, empêchant ainsi les effets négatifs potentiels pour l'environnement et la santé des personnes qui résultent de la gestion inappropriée des déchets.

ALIMENTATION NECESSAIRE

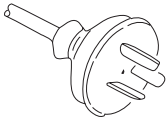
Vérifier le type de prise de courant utilisé dans votre pays. Si le cordon secteur approprié n'est pas fourni avec votre appareil, contacter votre distributeur PENTAX.



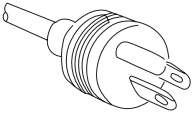
Europe Continental
(Utiliser une tiche homologuée SEV pour la Suisse)



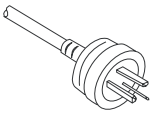
Royaume-Uni



Australia
et
Nouvelle Zéaland

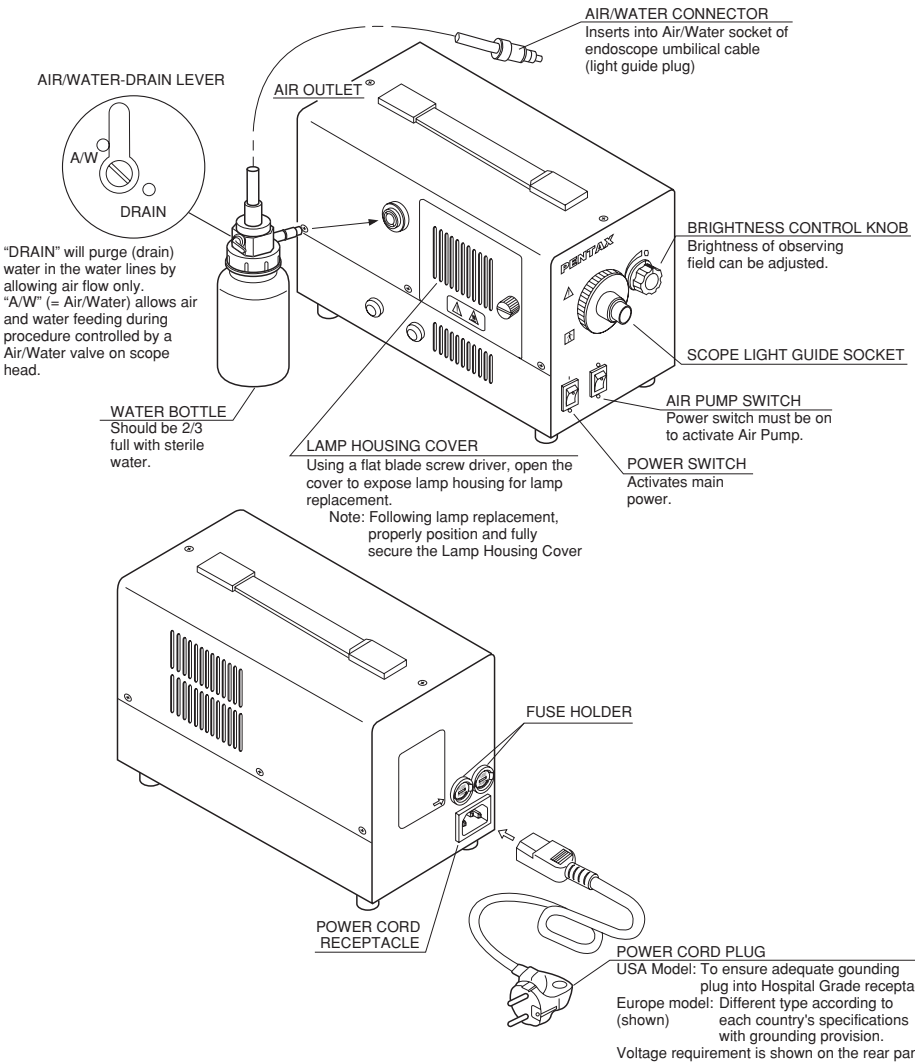


U.S.A. et
Canada
(Normes Hôspital)



China

2. NOMENCLATURE AND FUNCTION



NOTE:

Do NOT use the new PENTAX OS-H4 water bottle cap with the older OS-H2 water container/bottle. Although the cap may appear to fit onto the bottle, air may escape resulting in insufficient pressure and flow of air and water during the endoscopic procedure. Both the PENTAX water bottle cap and bottle (container) are identified by their appropriate model designation. Ensure that an OS-H4 cap is used only with the OS-H4 water container/bottle. Do NOT overtighten the bottle cap. Overtightening can cause the bottle cap to break.

3. PREPARATION AND SAFETY CHECK

3-1. PREPARATION

3-1-1. SETTING UP THE LIGHT SOURCE

1) Place the light source on a stable, level surface.

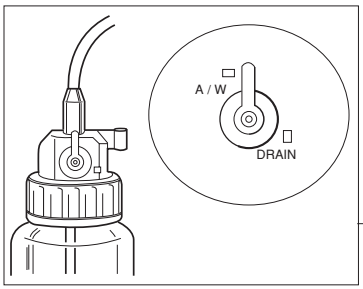
> ⚠*WARNING:*
> – *Avoid places where the light source may be splashed with liquid.*
> – *Absolutely do NOT use in any environment with explosive or flammable gases or chemicals.*
> – *Do NOT block the ventilation grids on the sides of the light source.*
> – *Do NOT install, operate or store electro-medical equipment in a dusty environment. Accumulation of dust within these units may cause malfunction, smoke, or ignition.*

2) Make sure the power switch is OFF.

3) Plug the power cord into an appropriate power source using the plug supplied with the unit.

> *CAUTION:*
> *When using any ancillary equipment such as a TV monitor, connect power cords of the ancillary equipment to isolation transformers to prevent electric shock.*

> *NOTE:*
> *When using isolation transformers, be sure to check that the total power consumption of all the devices does not exceed the isolation transformers' power rating. Make sure that the power cord is connected to the main with an appropriate plug. Contact your local PENTAX distributor for the details.*



3-1-2. CONNECTING THE WATER BOTTLE

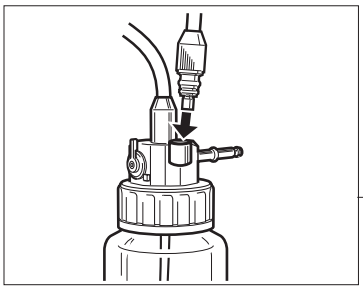
1) Fill the water bottle approx. 2/3 full with sterile water.

2) Screw the water bottle cap assembly to the water bottle snugly.

> *NOTE:*
> *Do NOT overtighten the water bottle cap.*

3) Set the Air/Water-Drain lever to A/W position.

4) Insert the water bottle air pipe stem into the LH-150PC water bottle receptacle and press until the water bottle 'clicks' into position.



> *NOTE:*
> *Do NOT press the water bottle too forcefully into the LH-150PC. Rough handling may cause water to leak onto/into the light source.*

5) Insert the Air/Water connector into the holding on the water bottle cap assembly until the endoscope is connected.

NOTE:

Always disconnect the water bottle before moving the light source into a position not common to normal use. Always disconnect the water bottle before packing the LH-150PC for shipment.

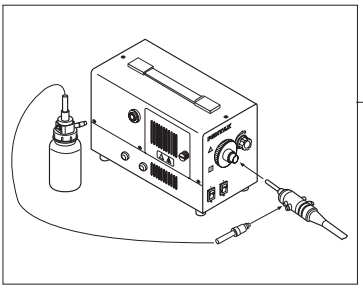
3-1-3. CONNECTING THE ENDOSCOPE

1) Check to ensure the appropriate light guide adapter is mounted to the light source.
   a. When using a PENTAX scope
      • Connect the adapter (OL-H3) to the scope light guide socket.
      • All PENTAX endoscope with either single or split light guide plug can be connected to this adapter (OL-H3).

NOTE:

OL-H3 is already installed when delivered from the factory.

   b. When using another manufacturer's flexible or rigid scope
      • Replace the OL-H3 with an appropriate adapter to the scope light guide socket. If the adapter has a pin for mounting, align the pin with the hole on the socket of the light source.
      • Contact your local PENTAX distributor or service facility.



NOTE:

Attempting to connect a fiberscope without a light guide adapter and/or an appropriate light guide sleeve in place will damage the fiberscope and the light source.

2) Connect the scope slowly.
3) Press the scope firmly until 'clicks' into position.
4) When using a PENTAX scope, connect the water bottle Air/Water connector to the Air/Water receptacle on the endoscope umbilical connector (light guide plug).
5) Connect the suction tube of the suction device to the suction nipple on the umbilical connector of the endoscope.

3-2. PRE-USE INSPECTION

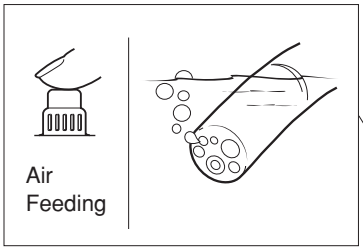
⚠*WARNING:*
Before every use, the following points should be checked:
If any function or device in the endoscopic system does not perform properly, do NOT perform the endoscopic examination.
Contact the manufacturer of the device, your PENTAX sales representative or a PENTAX service center before using the equipment for an endoscopic examination.

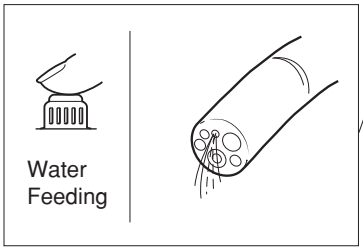
1) Ensure that the power cord is firmly plugged into a properly grounded receptacle.

CAUTION:
Do NOT stretch the cord tight to prevent the plug from coming off.

2) Ensure that an endoscope is connected to the appropriate light guide socket properly.
3) Turn the power switch ON by depressing the power switch labeled (|).
4) Confirm that light is seen at the distal end of scope.

NOTE:
If the power is not turned ON, replace the fuse on the rear panel.
If the lamp fails to light, replace the lamp.





CAUTION:
As a precaution, always have an extra (spare) lamp available as a standby lamp.

5) Depress the air pump switch.
6) Exercise Air/Water delivery through the endoscope. Covering air venting hole on top of Air/Water button lightly should deliver air at the distal end of the endoscope. By submerging the distal end in enough water to cover the tip, air flow will be demonstrated by a trail of bubbles. Pressing the button all the way down should deliver water through the tip of the endoscope. Use sterile water only.
   If all items above appear to function satisfactorily, then the endoscopic procedure may be performed. If any functionality above is compromised, do NOT attempt to perform the endoscopic procedure.
7) Turn the brightness control knob clockwise to increase the brightness level or counterclockwise to decrease the brightness level.

⚠*WARNING:*
Avoid looking directly at the light exiting the endoscope or the light source.

4. OPERATION

It is important that all features of this device should be understood prior to clinical use. Refer to the operating instructions supplied with all the components of the endoscope system such as endoscope, photographic equipment, etc.

1) Do NOT block the air intake vent while the light source is being used.
2) Be aware of the safety aspects of all other electrical equipment used in conjunction with this light source.
3) It is recommended to use the endoscope system in a dark room to observe clearly.
4) Select appropriate brightness level with the brightness control knob.

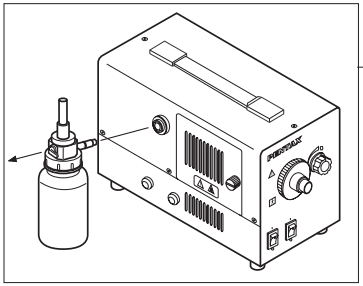
CAUTION:
To avoid thermal injury and to protect the user's eye from high intensity light, it is recommended to select the brightness level as low as possible.

5) Air pump should be turned ON to deliver air/water through endoscope.
6) Use only sterile water during the endoscopic procedure.

⚠*WARNING:*
NEVER drop this equipment or subject it to severe impact as it could compromise the functionality and/or safety of the unit. Should this equipment to be mishandled or dropped, do NOT use it.

5. MAINTENANCE

5-1. AFTER EACH PROCEDURE



1) Turn the power switch OFF (◯).
2) Unplug the power cord from the power cord receptacle.
3) Disconnect the endoscope and water bottle.

> ⚠*WARNING:*
> *Immediately after use, the metal light guide prong of the endoscope may be hot. To avoid burns, do NOT touch these arcas immediately after use.*

4) Wipe all surfaces with gauze slightly dampened with alcohol.

> *NOTE:*
> *NEVER allow liquids to be splashed on the light source. Be sure connector interfaces and ventilation ports are not allowed to become wet.*

5-2. WATER BOTTLE CLEANING

> *NOTE:*
> *Take care in handling the water bottle. Do NOT carry the water bottle by Air/Water connector or Air/Water hose. When the cap assembly has been separated from the bottle, be careful in handling the water feeding stem.*

The water bottle should be cleaned and sterilized on at least a daily basis.
The water bottle assembly must be thoroughly cleaned. Failure to do so could result in incomplete or ineffective sterilization.

5-2-1. CLEANING

1) After use, the entire water bottle assembly (bottle, cap assembly and tubing) should be washed with clean running water and dampened gauze or scrub brush. An enzymatic detergent should be used for soiled items.
2) Ultrasonic cleaning of entire water bottle assembly is recommended to access difficult to reach areas. Use an operating frequency of 44 kHz ±6% for a period 5 minutes.
3) After washing with the enzymatic solution, all surface of the water bottle assembly should be thoroughly rinsed and dried. Use gauze or cloth to wipe dry moist surfaces.
   Compressed air and 70 % alcohol should be used to facilitate drying of hard to reach areas.

> *CAUTION:*
> *To avoid disconnection and/or bursting of the internal tubing, always set the lever to the Air/Water position (upright) and use less than 165kPa (1,69kg/cm^2, 24PSI) air pressure during forced air drying.*

5-2-2. STERILIZATION

Before any sterilizing the water bottle assembly, ensure the cleaning process above has been completed.

STEAM STERILIZATION

NOTE:

LH-150PC standard water bottle assembly is model OS-H4 and is steam autoclavable. Do NOT confuse the OS-H4 steam autoclavable water bottle with its non-autoclavable predecessor.

The OS-H4 water bottle assembly can be easily identified by the black Air/Water hose, off-white colored plastic cap (not transparent) and clear plastic bottle.

1) The OS-H4 water bottle assembly has been designed to withstand high pressure steam sterilization procedures. Use the parameters below;

Sterilizer Type:	Prevacuum
Temperature:	132 ~ 135°C (270 ~ 275°F)
Time:	5 minutes

2) During steam sterilization, ensure the cap assembly has been removed from the bottle. Make sure that the drain lever on the water bottle cap has been set to the A/W position (upright).

CAUTION:

Use only the type of packaging material and package configuration as recommended by the manufacturer of the sterilizer. Use appropriate heat process indicators and/or biological monitors as recommended by the manufacturer of the sterilizer.

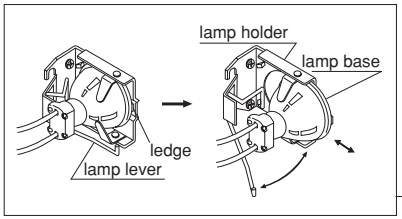
NOTE:

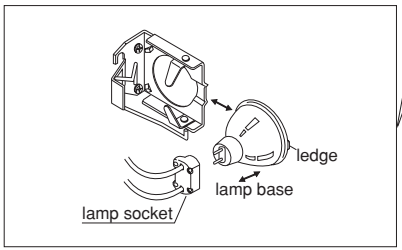
These sterilization parameters are only valid with sterilization equipment that is properly maintained and calibrated.

5-3. CHANGING THE LAMP

Should the lamp burn out, a new Halogen Lamp (OL-H4) supplied by PENTAX can easily be replaced in the following manner:

> ⚠*WARNING:*
> *Before proceeding, allow adequate time for the lamp to cool down. If the light source was used beforehand, the lamp may still be HOT.*





> *CAUTION:*
> *Be careful to avoid getting fingerprints on the lamp bulb or the reflector.*

1) Turn OFF the main power by depressing the power switch and disconnect the plug from the electrical outlet.
2) Using a flat brade screw driver, open the lamp housing cover to expose the lamp, lamp base, and lamp socket.
3) Move the lamp lever left to exposure the lamp base.
4) Pull out the lamp base from the lamp holder.
5) Pull out the lamp base from the lamp socket.
6) Replace the lamp base with a new lamp base and connect the lamp base to the lamp socket.
7) Push the lamp base into the lamp holder.

> *CAUTION:*
> *Ensure the position of the ledge to set the lamp correctly as shown left.*

8) Using a flat brade screw driver, close the lamp housing cover.

> *NOTE:*
> *Should the unit appear to fail to operate following lamp replacement, check to ensure that the lamp housing cover has been properly repositioned and fully secured.*

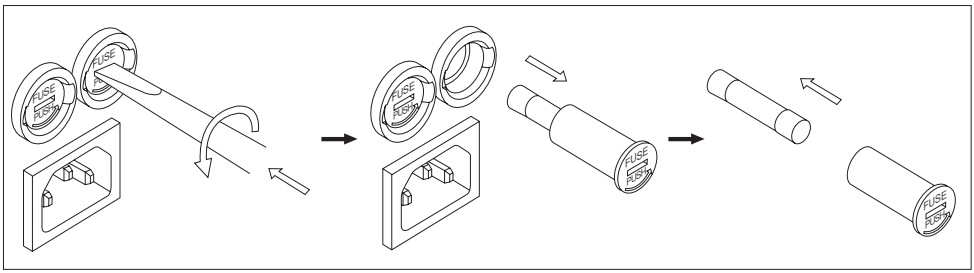
5-4. CHANGING THE FUSE

CAUTION:
Disconnect power cord before any examinations.

NOTE:
Changing the fuse will require a flat blade screw driver.

1) Using the flat-blade screwdriver remove the fuse holder.
2) Pull the fuse holder out by hand.
3) Inspect the fuse, remove and replace the fuse if blown.
4) Reinstall the fuse holder by turning clockwise with the driver.
5) The voltage should always be indicated on the fuse.

⚠WARNING
ALWAYS replace the fuse with the fuse value indicated on the rating plate on the rear panel. NEVER bypass the fuse. If the supplied spare fuse is not available, contact your local PENTAX service center.



6. SPECIFICATIONS

Specifications are subject to change without notice and without any obligation on the part of the manufacturer

Item	Specification	Observation		
Power requirement	Voltage	120 VAC	230 VAC	240 VAC
	Power consumption	200 VA		
	Voltage fluctuation	±10%		
	Frequency	50/60 Hz		
Operating environment	Ambient temperature	10-40ºC		
	Relative humidity	30-85%		
	Air pressure	700-1060 hPa		
Storage environment	Ambient temperature	-20-60ºC		
	Relative humidity	0-85%		
	Air pressure	700-1060 hPa		
Illumination	Lamp	EFR 15V 150W Halogen		
	Lamp's average life span	50 hours, continuous use		
Scope compatibility	PENTAX endoscope	All models of fiberscopes		
	Other manufacturer's fiberscope	All models with use of appropriate adapters		
Brightness Control		Manual adjustment		
Air feed system	Air pump system	Electro-magnetic vibrator system		
	Pressure *	41kPa – 62kPa (0.63kg/cm^2) at flow rate of 0		
	Standard air feed volume *	3.2-8.0ℓ/min at inlet of water bottle		
Water feed system	Water compression	Pressurized by pumped air		
	Water bottle capacity	250 mL		
	Water in normal use	≦ 2/3 full, sterile water		
Cooling	Forced air cooling			
Classification as electro medical equipment	Type of protection electric shock	Class 1 equipment		
	Degree of protection against electric shock	BF type using insulated scope Application to the heart directly should not be attempted.		
Safely & Hazardous prevention as Electromedical Equipment	To prevent electric shock, connect power cords of ancillary equipment to isolation transformers.			
	When using isolation transformers, be sure to check that the total power consumption of all the devices does not exceed the isolation transformers' power rating. Make sure that the power cord is connected the main with an appropriate plug.			
Compliance	Designed in accordance	IEC 60601-1, IEC 60601-2-18		
	Degree of explosion proofing	Use in potentially flammable surroundings is prohibited		
	Electromagnetic Compatibility	EN 60601-1-2 (2002) for EU IEC 60601-1-2 (2001) for other countries		
Size	Dimensions (W × H × D) *	W135 × H165 × D270 mm		
Weight	*	6kg		

*Subject to fluctuation.

7. ELECTROMAGNETIC COMPATIBILITY

Guidance and manufacturer's declaration-electromagnetic emissions

The LH-150PC is intended for use in the electromagnetic environment specified below. The customer or the user of the LH-150PC should assure that it is used in such an environment.

Emissions test	Compliance	Electromagnetic environment-guidance
RF emissions CISPR 11	Group 1	The LH-150PC 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 LH-150PC 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 purposes.
Harmonic emissions IEC 61000-3-2	Class A	
Voltage fluctuations/ flicker emissions IEC 61000-3-3	Complies	

Guidance and manufacturer's declaration-electromagnetic immunity

The LH-150PC is intended for use in the electromagnetic environment specified below. The customer or the user of the LH-150PC should assure that it is used in such an environment.

Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment-guidance
Electrostatic discharge (ESD) IEC 61000-4-2	±(2, 4, 6) kV contact ±(2, 4, 8) kV air	±(2, 4, 6) kV contact ±(2, 4, 8) kV air	Floors should be wood, concrete or ceramic tile, if floors are covered with synthetic material, the relative humidity should be at least 30 %.
Electrical fest transient/burst IEC 61000-4-4	±2 kV for power supply lines ±1 kV for signal lines	±2 kV for power supply lines ±1 kV for signal 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 % *U*T (>95 % dip in *U*T) for 0.5 cycle 40 % *U*T (60 % dip in *U*T) for 5 cycles 70 % *U*T (30 % dip in *U*T) for 25 cycles <5 % *U*T (>95 % dip in *U*T) for 5 sec	<5 % *U*T (>95 % dip in *U*T) for 0.5 cycle 40 % *U*T (60 % dip in *U*T) for 5 cycles 70 % *U*T (30 % dip in *U*T) for 25 cycles <5 % *U*T (>95 % dip in *U*T) for 5 sec	Mains power quality should be that of a typical commercial or hospital environment, if the user of the LH-150PC requires continued operation during power mains interruptions, it is recommended that the LH-150PC be powered from an uninterruptible power supply.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3A/m	3A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.

NOTE *U*T is the a.c. mains voltage prior to application of the test level.

Guidance and manufacturer's declaration-electromagnetic immunity

The LH-150PC is intended for use in the electromagnetic environment specified below. The customer or the user of the LH-150PC should assure that it is used in such an environment.

Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment-guidance
			Portable and mobile RF communications equipment should be used no closet to any part of the LH-150PC, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. **Recommended separation distance**
Conducted RF	3 Vrms	3 Vrms	$d = 1.2\sqrt{P}$
IEC 61000-4-6	150 kHz to 80 MHz		$d = 1.2\sqrt{P}$ 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).
Radiated RF	3 V/m	3V/m	Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey, should be less than the compliance level in each frequency range
IEC 61000-4-3	80 MHz to 2.5 GHz		Interferance 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 LH-150PC is used exceeds the applicable RF complience level above, the LH-150PC should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary such as reorlenting or relocating the LH-150PC.

[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 LH-150PC

The LH-150PC is intended for use in the electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the LH-150PC can help prevent electromagnetic interference by mainteining a minimum distance between portable and mobile RF communications equipment (transmitters) and the LH-150PC 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 m	0.12 m	0.23 m
0.1	0.38 m	0.38 m	0.73 m
1	1.2 m	1.2 m	2.3 m
10	3.8 m	3.8 m	7.3 m
100	12 m	12 m	23 m

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 quidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

MEMO

FOR EUROPEAN COUNTRIES

DECLARATION OF CONFORMITY

CE 0197

We, **PENTAX Corporation**

2-36-9, Maeno-cho, Itabashi-ku, 174-8639 Tokyo, Japan

declare under our sole responsibility, that the product:

Product Name : HALOGEN LIGHT SOURCE
Model Number (S) : LH-150PC

conforms to the applicable provisions of the Medical Devices Directive 93/42/EEC.

This declaration is made on the basis of: EC quality system approval issued by Tüv Rheinland No. 0197 in accordance with Annex II of this Directive.

PENTAX Europe GmbH
European Representative

PENTAX Corporation
Manufacturer

NOTICE

This equipment is a Class B Medical Equipment (specified EN55011) and is intended for hospital or health care districts.

When used in clinical or residential areas near radio and TV receiver units, this equipment may be subjected to radio interference.

To reduce electromagnetic interference, do NOT keep turning ON the main POWER SWITCH of the equipment while an endoscope is connected but not ready for use.

To avoid and resolve adverse electromagnetic effects, do NOT operate this equipment near the RF energy equipment.

Only the power cord specified by PENTAX conform to the above standards.

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Our representative in your area:

● Specifications are subject to change without notice and without any obligation on the part of the manufacturer.

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