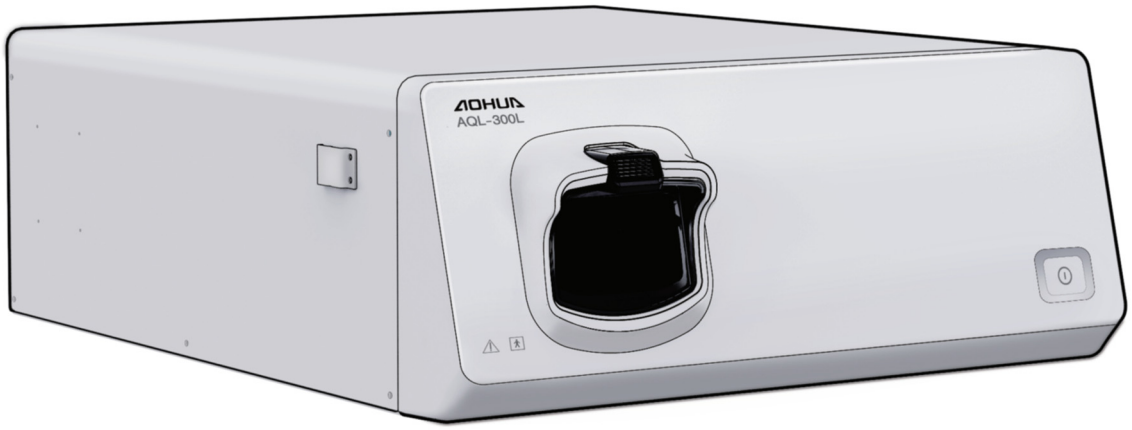
AOHUA

LIGHT SOURCE

AQL-300L

INSTRUCTIONS FOR USE



Shanghai AOHUA Photoelectricity
Endoscope Co., LTD.

CE 0344

Important information — Please Read Before Use

- Before use, thoroughly review this manual.
- Please keep all instruction manuals in a safe, accessible place.
- Contact for any questions or comments about this instruction manual.

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Important Information — Please Read Before Use

Intended use

The light source is intended to be used with Aohua endoscopes, endoscope imaging processors, and other ancillary equipment for endoscopic diagnosis, treatment and video observation. It is also designed to supply air through the endoscope while inside the body.
Do not use this light source for any purpose other than its intended use.

Instruction manual

This instruction manual should be kept in an accessible place. Before use, thoroughly review this manual which contains essential information on using the light source safely and effectively and the manual of all equipment that will be used during the procedure.
For any questions about the information provided in this instruction manual, contact Aohua.

User qualifications

This instrument should be used by persons trained in the use of this instrument.
If there is an official standard on user qualifications to perform endoscopy and endoscopic treatment that is defined by the medical administration or other official institutions, such as academic society on endoscopy and endoscopy physicians, follow that standard. If there is no official qualification standard, the operator of this instrument must be a physician approved by the medical safety manager of the healthcare facility or person in charge of the department (department of internal medicine, etc.).
The physician should be qualified to operate and safety perform the planned endoscopy and endoscopic treatment following guidelines set by the academic societies on endoscopy, etc., and considering the difficulty of endoscopy and endoscopic treatment. This manual does not explain or discuss endoscopic procedures.

Ancillary equipment

The safety of the light source does not only rely on itself, but also relies on its ancillary equipment. To guarantee the compatibility, only the ancillary equipment manufactured by Aohua or confirmed by Aohua is recommended to use.
Aohua prepared the standard accessory and spares list. Please carefully check the items in the package according to the list provided in Section 1.1, “Checking the package contents list” after purchase. If any item is missing or damaged, contact Aohua or distributor immediately.

Important Information — Please Read Before Use

Instrument compatibility

Before use, please refer to “Ancillary Equipment” to confirm that this instrument is compatible with the ancillary equipment being used. Using incompatible equipment can result in patient or operator injury and/or equipment damage.

Spare equipment

Be sure to prepare another light source to avoid interruptions during examination due to equipment failure or malfunction.

Repair and modification

This instrument does not contain any user-serviceable parts. Do not disassemble, modify or attempt to repair it; patient or operator injury and/or equipment damage and/or the failure to obtain the expected functionality may result. This instrument should be repaired by Aohua authorized personnel only.

Signal words

The following signal words are used throughout this manual:

: It indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

: It indicates a potentially hazardous situation, if not be avoided, could result in death or serious injury.

: It indicates a potentially hazardous situation, if not be avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices or potential equipment damage.

: It indicates additional helpfulinformation.

Dangers, warnings and cautions

Follow the warnings and cautions below when handling this instrument. Information below is to be supplemented in each chapter.

Important Information — Please Read Before Use

DANGER

- As a TYPE BF applied part, the endoscope connected to the light source must never be applied to the heart or any area near the heart. Leakage current from the TYPE BF applied part may be dangerous and cause ventricular fibrillation or seriously affect the cardiac function of the patient.
- Never allow an endotherapy accessory or another endoscope applied to or near the heart to come in contact with the endoscope connected to this light source.
- Strictly observe the following precautions. Failure to do so may put the patient and the medical personnel in danger.
- When the instrument is used to examine a patient, do not allow metal parts of the endoscope or its accessories to touch metal parts of other system components.
- Keep fluids away from all electrical equipment. If fluids are spill on or into the unit, stop operation immediately and contact Aohua.
- Do not prepare, inspect or use this light source with wet hands.
- Never install and operate the light source in location where:
  - The concentration of oxygen is high.
  - Oxidizing agent (such as nitrous oxide (N2O)) or flammable anesthetics are present in the atmosphere.
  - Flammable liquids are nearby.
- When using the light source with auxiliary equipment, the auxiliary equipment, (e.g. video recorder, printer) must apply isolation transformers or insulation sockets.

WARNING

- This device must be operated by a medical practitioner capable of safely performing endoscopy after operation technique training. Do not use this instrument for any purpose other than its intended use.
- Do not look directly into the distal end of the endoscope or the output socket of the light source while the light source is ON.
- Do not insert anything into the ventilation grills of the light source. Electric shock may result.
- Do not look directly into the distal end of the endoscope or the output socket of the light source when they are emitting light. Eye injury may be caused by the intense light.
- Do not touch the distal end of the endoscope connector of the endoscope or output socket of the light source immediately after disconnecting it from the light source because of the extremely high temperature. Operator or patient injury may result.

Important Information — Please Read Before Use

WARNING

- Always set the brightness to the minimum necessary level to avoid protein denaturation or perforation.
- Do not continuously observe in the proximity of a tissue for a long period. Alternation of living tissues may result.
- Do not bring the disconnected end of the endoscope or the distal end of the optical fiber in contact with flammable objects. A fire or burn may result.
- Confirm that the power cord is disconnected from the mains power supply before lamp or fuse replacement. Otherwise, electric shock may result.
- Always wear appropriate gloves that fit properly so that your skin is not exposed. Blood, mucus, and other potentially infectious material adhering to the video system center could pose an infection control risk.
- Be sure to use the ancillary equipment manufactured by Aohua or confirmed by Aohua is recommended to use. Using incompatible equipment can result in patient or operator injury and/or equipment damage.

CAUTION

- This instrument shall be used with auxiliary equipment or accessories complied with relevant EMC standards for safety reason. Otherwise, performance of the light source may be affected.
- Portable or mobile phones may cause radio interference to this instrument. Relocating the light source or provide shield to the location if the radio interference occurs.

Important Information — Please Read Before Use

Labels and symbols

	Type BF equipment
	Protective earth(ground)
	Caution
	Equipotential
	European Community authorized representative
	Catalogue number
	Refer to instruction manual
	Date of manufacture
	Manufacturer
	Keep away from rain
	Use-by date
	Protect from heat and radioactive source
	Serial number
	Fragile, handle with care
	Stack up
	Temperature limit

Important Information — Please Read Before Use

MD	Medical device
UDI	Unique device identifier
CE 0344	CE marking. With this marking, the manufacturer declares the conformity of the product with the applicable REGULATION (EU) 2017/745 on medical devices. A code number after the CE mark indicates the responsible notified body.
	In accordance with European Directive 2012/19/EU on Waste Electrical and Electronic Equipment, this symbol indicates that the product must not be disposed of as unsorted municipal waste, but should be collected separately.

01 Checking the Package Contents

1.1 Checking the package contents list

CAUTION

- Check all items in the package against the components listed below. If any component is missing or damaged, do not use the item; please contact Aohua immediately. Accessories below in the list are only for the reference. Please refer to the packing list/shipping list included in each shipment.

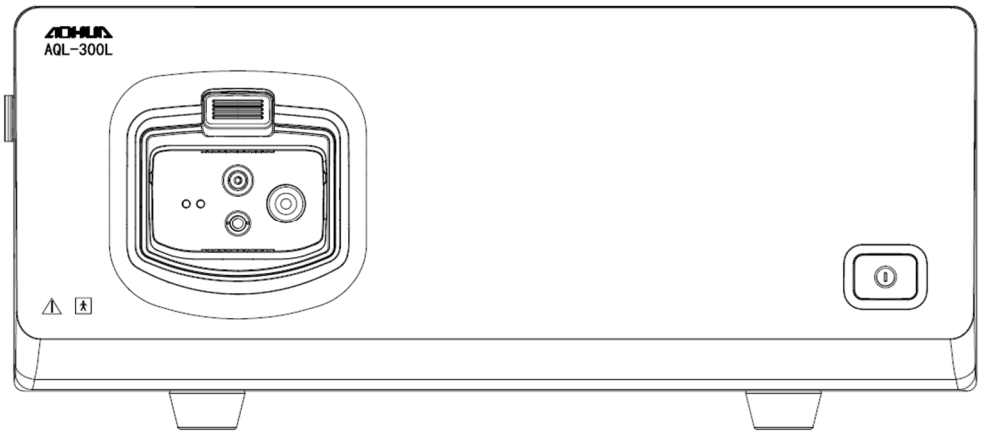
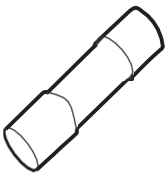
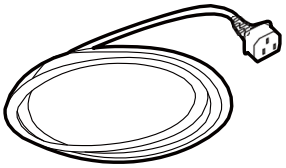
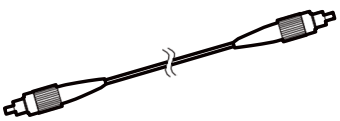
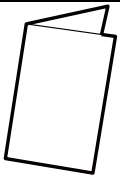


Figure 1: AQL-300L light source

 Fuse	 Power cord
 Interconnected optical fiber	 User manual

02 Nomenclature and Functions

2.1 Nomenclature and functions

2.1.1 Front panel

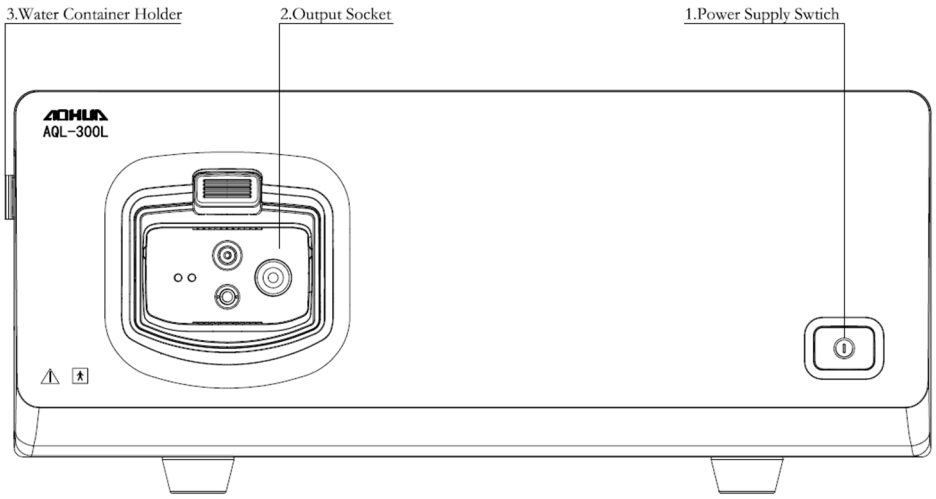


Figure 2.1.1 Front panel

Nomenclature	Description
1. Power supply switch	Press to turn the light source ON or OFF.
2. Output socket	Connects the endoscope to this socket. This socket provides light and air to the endoscope.
3. Water container holder	This holder is used to install the water container.

CAUTION

- It is prohibited to position any other objectives than water container on the water container holder.

2.1.2 Rear panel

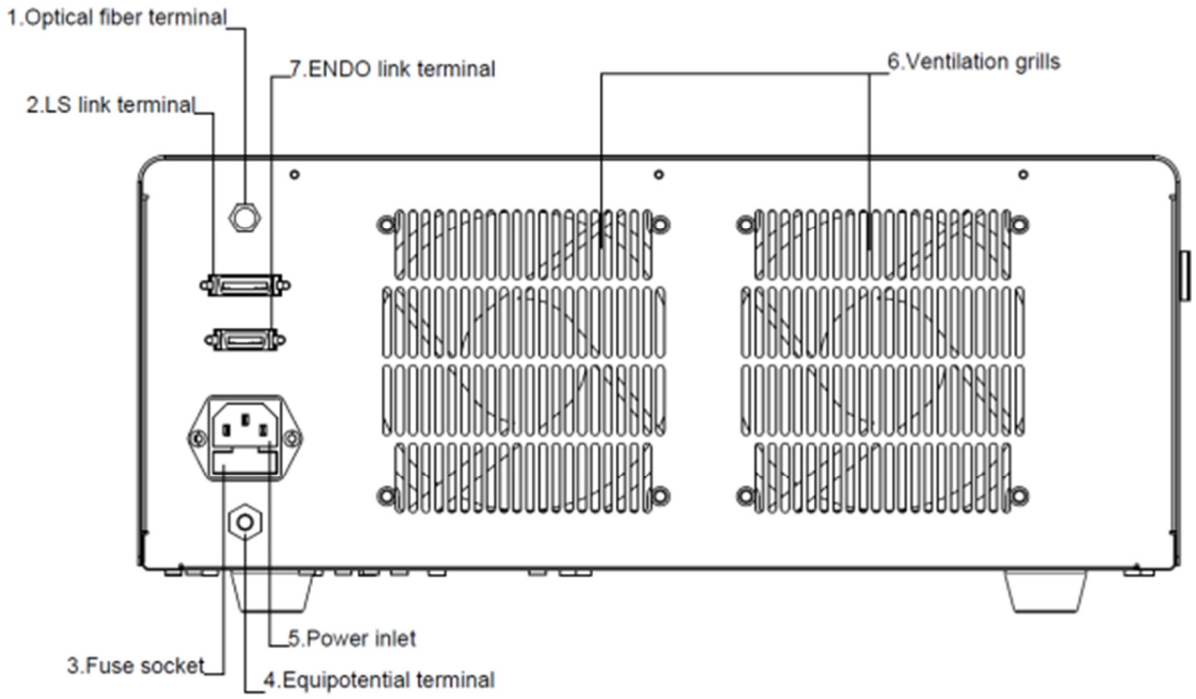


Figure 2.1.2 Rear panel

Nomenclature	Description
1. Optical fiber terminal	This terminal is the receptacle for the data communication between the light source and the imaging processor.
2. LS link terminal	This terminal is the receptacle for the data communication between the light source and the imaging processor.
3. Fuse socket	This socket is used to install fuse to protect light source when the current is too large.
4. Equipotential terminal	This terminal is connected to a potential equalization terminal of the other equipment connected to the light source. The electrical potential of the equipment is equalized.
5. Power inlet	Connect the provided power cord to the mains power supply via this inlet.
6. Ventilation grills	The air in the light source is ventilated through the grills for cooling.
7. ENDO Link terminal	This terminal is the receptacle for the data communication between the endoscope imaging processor and the endoscope.

02 Nomenclature and Functions

CAUTION

- Turn OFF the rear board switch when the light source is left unused for a long time.
- Do not cover or block the ventilation grills. Malfunction or damage may be caused due to the high temperature.

2.2 Main electrical components

1. Three-pin plug and socket.
2. Air pump.
3. Axial fan.
4. Power switch.
5. Fuse for AQL-300L (T 2.5A L 250V).
6. LED examination lamp

2.3 Product characteristics

1. This equipment is classified as class I type of protection against electric shock and BF type applied part.
2. The ingress protection rating is common device.
3. Applied part of this instrument: Endoscope.
4. Manufacturer: Shanghai AOHUA Photoelectricity Endoscope Co.,Ltd.
5. Product name: light source.
6. Model type: AQL-300L
7. Running mode: Continuous running.
8. Type BF equipment 
9. Protective earth (ground) 
10. Caution! : Consult accompanying document. 
11. Equipotential 
12. Power ON/OFF 

13 Classified as non-AP device or APG device, according to the safety rating of performing in air and flammable anesthetic gas mixture; or oxygen/nitrous oxide and flammable anesthetic gas mixture

14 Laser classification: Class I.

2.4 Performance characteristics

1 The light sources AQL-300L adopted LED lamp as examination lamp.

2 Equipped with two illumination modes (white light illumination mode and CBI (Compound Band Imaging) mode). Under the CBI mode, the light source and the imaging processor can provide intelligent chromo image.

3 The brightness is adjustable. Two brightness adjustment modes, automatic manual adjustment modes, are applied.

4 Equipped with a built-in micro axial fan for ventilation and cooling.

5 Equipped with air pump to provide airflow with low, medium or high pressure level.

6 Equipped with hot-swap protection function, if the user mistakenly pulls out the endoscope when the system is still working, the system will instantly shut OFF signal transmission and power supply to the endoscope, and will automatically recover signal transmission and power supply when the endoscope is reconnected, which significantly decreases the probability of damage occurrence resulting from connection and disconnection of endoscope under power-on condition. Nevertheless, the user shall not connect or disconnect the endoscope while the light source is turned on.

- Hot-swap is a protective function. To avoid unnecessary damages to the equipment, do not connect or disconnect the endoscope when the power of the light source is ON. Aohua is not responsible for any human injuries or light source damages resulting from unapproved and frequent hot-swap by the user in any manner.

02 Nomenclature and Functions

2.5 Specifications

2.5.1 Operating environment

- Ambient temperature : 5°C - 40°C
- Relative humidity : 30% - 85%
- Atmospheric pressure : 700 - 1060hPa
- Power supply : 100-240V AC, 50/60Hz
- Input power : 300VA

2.5.2 Product Structural Composition

The AQL-300L light source is composed of LED lamp, switching mode power supply, air pump, control circuit, wireless power supply circuit and accessories including power cord and interconnected optical fiber. It is portable and does not contain light guide bundle.

2.5.3 Compatible devices

This light source is intended to be used with endoscope imaging processor (AQ-300), UHD series video endoscopes manufactured by Aohua, monitor and other ancillary equipment that comply with relevant regulations and safety standards.

CAUTION

- All interconnected devices shall comply with the relevant requirements for safety use.

1. Interconnected endoscope: UHD series video endoscopes manufactured by Aohua.
2. Interconnected imaging processor: AQ-300 endoscope imaging processors manufactured by Aohua.

2.5.4 Light source specifications

Specifications	AQL-300L
Color Rendering Index (CRI)	⩾ 90
Correlated Color Temperature	3000K – 7000K
Total output luminous flux	White light illumination mode: 300 lm CBI mode: 25 lm
Airflow pressure	40 kpa - 90kpa
Airflow rating	L – Low level: 4L/min; M – Medium level: 5L/min; H – High level: 7L/min.
Software version	V1

03 Preparation and Inspection

Prepare the light source and compatible equipment before each use. Install and connect the equipment according to the procedures described in this chapter and the instruction manuals for ancillary equipment.

3.1 Light source installation

CAUTION

- Do not cover or block the ventilation grills of the light source. Ventilation grills blockage will overheat and cause damage to the device.
- Ensure reliable grounding. Power supply requirement:
- Users need to provide AC 100V-240V and 50/60 Hz power supply; if the voltage is not stable, automatically regulated power supply must be provided (over 1000W, residential used voltage regulator shall not be used.) Contact Aohua for any questions.
- The same voltage regulator cannot be shared with other electrical products with large electricity consumption.
- The user has to provide the power supply with reliable and safe grounding.
- For frequent power outage regions, UPS (Uninterruptible power supply) is recommended to use to ensure the normal operation of this system. Connect the power cord of the light source with the power supply input inlet of the USP.
- Insert the endoscope connector into the output socket with correct direction. It is prohibited to forcibly insert the connector.
- All ancillary equipment connected with the light source should be passive or safe extra-low voltage devices or devices with double insulation isolation from the supply mains and shall comply with the relevant requirements (such as IEC 60601-1, IEC 62368, IEC 60950, etc.).

1. Inspect and ensure the grounding is reliable, the fuse is in good condition, and all ventilation grills are uncovered and unblocked. Ensure that the power supply switches of the endoscope imaging processor and the light source are OFF.
2. Insert the endoscope connector of the endoscope firmly into the endoscope connector of the light source as shown in Figure 3.1.1.

03 Preparation and Inspection

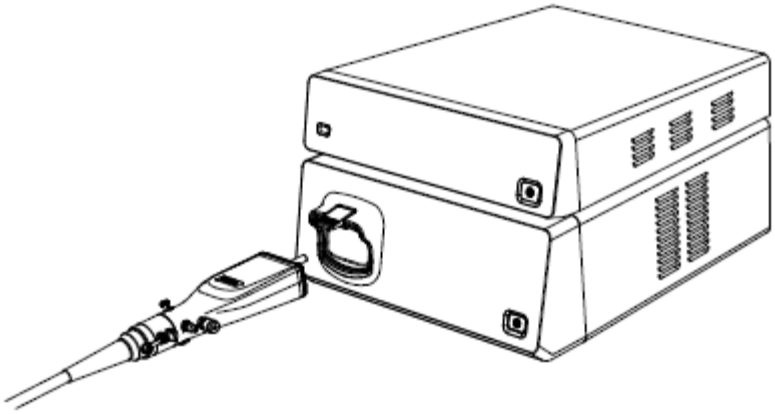


Figure 3.1.1

CAUTION

- When install the light source, keep the light source away from equipment with high energy and high power, or equipment emitting electromagnetic inference (such as CT equipment, X-ray equipment, microwave therapy apparatus, high frequency hyperthermia instrument, MRI equipment, radio communication device, etc.). Interruption of radio signals will appear on the display screen if the inference occurs, resulting in degradation on image quality. It is recommended to stay away from the inference source if the noise occurs.
- Hot-swap is a protective function. Avoid connecting or disconnecting the endoscope when the power of the light source is ON.

3 Connect the imaging processor and the light source by using the interconnected optical fiber, LS LINK cable, and the ENDO LINK cable.

The wavelength of nonvisible emission light: 850nm.
Refer to IEC 60825-1:2014 for relevant requirements.

CAUTION

- Do not turn the light source on before connecting the imaging processor and the light source with optical fiber.
- Do not forcibly bend the interconnected optical fiber. Fracture to the fiber may result.

03 Preparation and Inspection

CAUTION

- When connecting, the convex of the optical fiber should be aligned with the concave of the Optical fiber terminal at the rear panel of the light source.
- Do not observe the end of the optical fiber terminal. Injury may result due to intense light.
- The power plug is considered as a disconnection device, it should be put in the suitable station and easily to operate.

4 Connect the power inlet at the rear panel of the light source and the mains power supply via the provided power cord.

3.2 Inspection of the power supply

Confirm that the ventilation grills are not covered or blocked with dust, and that the light source can be turned ON.

WARNING

- Do not look directly into the distal end of the endoscope or the output socket of the light source when they are emitting light. Eye injury may result.

1 Confirm that the ventilation grills on the rear panel of the light source are not covered or blocked with dust or other materials.

2 Press the power switch at the front panel of the light source to turn ON the power supply.

3 Confirm that the green power indicator lights up, and that the axial fan rotates.

4 Confirm that air is ventilated by holding hand in front of the ventilation grills.

5 Confirm that all brightness indicators lighten up during self-inspection are extinguished after self-inspection. If the beeps are heard, indicating the self-inspection failed, turn OFF the power switch on the front panel immediately; cut OFF the power supply and contact Aohua.

6 If the power fails to turn ON, turn OFF the light source. Then confirm that the power cord is firmly connected. Then, turn the light source ON again. If the power still fails to turn ON, contact Aohua.

03 Preparation and Inspection

WARNING

- If air is not ventilated through the ventilation grills, do not use the light source and contact Aohua.

3.3 Inspection of the lamp usage indicator

Check the lamp usage indicator. When the “10000h” indicator on the lamp usage indicator lights up, contact Aohua.

3.4 Inspection of the examination light

WARNING

- Do not look directly into the distal end of the endoscope or the endoscope connector of the light source when they are emitting light. Eye injury may result.

CAUTION

- The light source works together with the imaging processor to perform lamp ignition and extinguishing function through operating the brightness adjustment mode icon “A/M” on the touch panel of the endoscope imaging processor. Therefore, also refer to the instruction manual of the imaging processor for the safe preparation and inspection.

1. Tap the “ILLUMI.” icon on the touch panel of the endoscope imaging processor to ignite the examination lamp.
2. Confirm that the examination light is emitted from the distal end of the endoscope. When the lamp light intensity decrease, replace the examination lamp with a new one as described in Section 4.9, “Lamp replacement”.

3 Tap the “ILLUMI.” icon on the touch panel of the endoscope imaging processor to extinguish the lamp.

4 Confirm that the examination light is not emitted from the distal end of the endoscope.

3.5 Inspection of the brightness adjustment mode selection and function

Confirm that the brightness adjustment mode can be switched between automatic mode and manual mode.

CAUTION

- The light source works together with the endoscope imaging processor to perform brightness adjustment function through operating the brightness adjustment mode icon “A/M” on the touch panel of the endoscope imaging processor. Therefore, also refer to the instruction manual of the imaging processor for the safe preparation and inspection.

1 Tap the brightness adjustment mode icon on the touch panel of the endoscope imaging processor and confirm that each tap switches the brightness adjustment mode indicator between “A” and “M”.

3.6 Inspection of the brightness adjustment

Confirm that the brightness of the examination lamp can be adjusted.

CAUTION

- The light source works together with the endoscope imaging processor to perform brightness adjustment function through operating the brightness adjustment on the touch panel of the endoscope imaging processor. Therefore, also refer to the instruction manual of the imaging processor for the safe preparation and inspection.

3.6.1 Inspection of the automatic brightness adjustment

1. Confirm that the endoscope is connected to the light source, that the light source is connected with the endoscope imaging processor, and that both are turned ON.
2. Tap the “ILLUMI.” icon on the front panel to ignite examination lamp.
3. Tap the bright adjustment mode icon on the touch panel of the endoscope imaging processor and select “A”.
4. Point the distal end of the endoscope at a suitable object and vary the distance. Confirm that the light being emitted from the distal end varies with the distance.
5. Hold the distal end of the endoscope at a distance about 30mm to the object and tap the brightness enhancement and detraction icons. Confirm that the brightness of the light emitted from the distal end of the endoscope increases or decreases accordingly.

3.6.2 Inspection of the manual brightness adjustment

WARNING

- When using the manual brightness adjustment, always set the brightness to the minimum level necessary to complete the examination. Eye injury or burns may result due to intense light.

1. Confirm that the endoscope is connected to the light source, that the light source is connected with the imaging processor, and that both are turned ON.
2. Tap the “ILLUMI.” icon on the front panel to ignite examination lamp.
3. Tap the bright adjustment mode icon on the touch panel of the endoscope imaging processor and select “M”.
4. Slide the brightness bar to adjust the brightness level. Confirm that the brightness of the light emitted from the distal end of the endoscope increases or decreases according to the brightness.

3.7 Inspection of the illumination mode selection function

Confirm that the illumination mode can be switched among the white light mode and CBI (compound lights) mode.

03 Preparation and Inspection

CAUTION

- The light source works together with the endoscope imaging processor to perform illumination, mode selection function through operating the brightness adjustment icon “CBI” on the touch panel of the endoscope imaging processor. Therefore, also refer to the instruction manual of the imaging processor for the safe preparation and inspection.

1. Tap and hold the illumination mode icon “CBI Regular” or “CBI Plus” on the touch panel of the endoscope imaging processor to select the mode, and confirm that each tap switches the illumination mode between the white light mode and the CBI mode.

3.8 Inspection of the air and water feeding

The light source incorporates an air pump and water from the water container to feed air and water into the body cavity from the nozzle at the distal end of endoscope. Confirm that air and water is fed from the nozzle at the endoscope’s distal end and the amount of air and water changes by adjusting the airflow level.

CAUTION

- The light source works together with the endoscope imaging processor and endoscope to perform air and water feeding function. Therefore, also refer to the instruction manual of the imaging processor for the safe preparation and inspection.

NOTE

- The air and water feeding function is not available when no endoscope or an incompatible endoscope is connected to the light source.

1. Tap and hold the pump icon to select the airflow rate level among “L” (low),” M” (medium),” H(high)”.
2. Tap the pump icon repeatedly to turn on the pump.

3. Tap the pump icon to set the airflow to Low.
4. Immerse the distal end of the insertion section in the sterile water.
5. Cover the hole of the air/water valve of the endoscope.
6. Tap the pump icon to change the airflow level setting and confirm that the amount of bubbles from the nozzle changes accordingly.
7. Release the hole of the air/water valve of the endoscope.
8. Remove the distal end of the insertion section from the sterile water.
9. Depress the air/water valve of the endoscope.
10. Tap the pump icon to change the airflow level and confirm that the amount of water from the nozzle changes accordingly.
11. Release the air/water valve of the endoscope.

04 Operation

The operator of the light source must be a medical practitioner capable of safely performing endoscopy after operation technique training. This manual does not explain or discuss clinical endoscopic procedures. It only describes basic operation of the light source. Before using the endoscope, ensure to perform preparation inspection on the light source as described in Chapter 3, “Preparation and inspection”.

4.1 Precautions

WARNING

- If any irregularity is observed, do not use the light source. Electric shock may result.
- Do not use the light source in the flammable gas. Fire or explosion may result.
- Do not look directly into the distal end of the endoscope or the output socket of the light source when they are emitting light. Eye injury may result.

CAUTION

- Before disconnecting the endoscope with the light source, power supply must be turned OFF.
- Do not turn the power supply switch of the light source ON frequently. Wait for at least 8 seconds to turn it on again.
- During the self-inspection of the light source, if the beeps are heard, indicating the self-inspection failed, turn OFF the power switch on the front panel immediately; cut OFF the power supply and contact Aohua.
- During the operation of light source, if the beeps are heard and the light source automatically switches to emergency lamp, it indicates the overheating protection of the lamp module is active. Continuous using of the light source may cause damage to the equipment. Finish the examination as soon as possible, turn OFF the power switch on the front panel of the light source, cut OFF the power supply and contact Aohua.
- During the operation of light source, if the beeps are heard, it indicates the failure of fans and the malfunction of cooling system. Finish the examination as soon as possible, turn OFF the power switch on the front panel of the light source, cut OFF the power supply and contact Aohua.
- The lamp usage Indicator represents the total working hours of the lamp. The indicator will turn red when working hours pass to remind the user that the potential decrease in

04 Operation

CAUTION

chromaticity, luminance and CRI, resulting in poor observation performance.

- The lamp is consumable, and does not cover by the warranty.
- The light source works together with the endoscope imaging processor to perform functions Therefore, also refer to the instruction manual of the imaging processor for the safe operation.

4.2 Turning the light source ON and igniting the examination lamp

WARNING

- When turning on the light source, do not contact the distal end of the endoscope with the patient and/or any flammable materials. A fire or patient injury may result.

CAUTION

- The light source works together with the endoscope imaging processor to perform lamp ignition through operating the "ILLUM." Icon on the touch panel of the endoscope imaging processor. Therefore, refer to the instruction manual of the imaging processor for the safe operation.

1. Confirm the proper connection between the endoscope connector and the output socket of the light source.
2. Press the power switch of the light source. Also, tap the "ILLUMI." icon to ignite the examination lamp.

NOTE

- The lamp may not achieve the set brightness instantly after ignition; wait at most 2 seconds for regular brightness.

04 Operation

4.3 Brightness adjustment mode setting

The brightness adjustment mode determines the examination light intensity supplied to the endoscope and the method of intensity adjustment.

1. Tap the brightness adjustment icon on the touch panel of the imaging processor and confirm that each tap switches the brightness mode indicator between “A” and “M”.

4.4 Brightness adjustment

Adjust the brightness of the examination lamp.

4.4.1 Automatic brightness adjustment

CAUTION

- Turn the endoscope imaging processor on to enable the automatic brightness adjustment. The failure in automatic brightness adjustment and inadequate brightness may result.

1. In the automatic mode, the light source can automatically adjust the light intensity according to the control signal of the image processor. The set brightness is shown on the brightness bar.

4.4.2 Manual brightness adjustment

WARNING

- Always adjust the examination light to the minimum required brightness for observation, and do not bring the examination light to the proximity of a mucous membrane for extended time.

1. Slide the brightness bar to increase or decrease the brightness for observation. The set brightness is shown on the brightness bar.

4.5 Illumination mode setting

The illumination mode determines the examination light supplied to the endoscope. This light source equipped with two illumination modes, white light mode and CBI mode. In the CBI mode, the light source and the endoscope imaging processor can provide intelligent chromo image.

NOTE

- In the white light mode, the light emitted is regular white light.
- In the CBI mode, the light emitted is compound light with two bands, which could provide intelligent chromo image at the time of visualization with endoscopy.

1. Tap and hold the “CBI Regular” or “CBI Plus” icon to select the CBI mode.

4.6 Air/water feeding

WARNING

- Over-insufflating air or water into the lumen may lead to patient pain, injury, bleeding, and/or perforation.

1. Confirm that the airflow switch is ON.
2. Tap and hold the pump icon to set the airflow level according to the examination technique and/or patient condition.
3. Feed the air/water as described in the endoscope’s instruction manual.

04 Operation

4.7 Extinguishing the examination lamp and turning the light source OFF

WARNING

- Do not touch the distal end of the endoscope, the distal end of the interconnected optical fiber, or the output socket of the light source immediately after disconnecting it from the light source. The extremely high temperature may cause injury to operator and/or patient.
- Do not bring the disconnected end of the endoscope or optical fiber in contact with a flammable object. A fire or burn may result due to the extremely high temperature.

1. Tap the "ILLUMI." icon to turn OFF the examination lamp.
2. Press the power switch on the front panel of the light source to turn OFF the power output; press down the locking lever at the top of the endoscope connector to release and disconnect the endoscope from the light source.

NOTE

- The locking lever on the endoscope connector is used to prevent the endoscope connector accidently disconnecting from the endoscope connector. Press down the locking lever to release the locking mechanism.

4.8 Fuse replacement

1. When failure occurs after turning ON the power switch, turn the power switch OFF and disconnect the power cord from the power inlet.
2. Remove the fuse from the fuse socket as shown in the figure 4.10, and check the fuse.

04 Operation

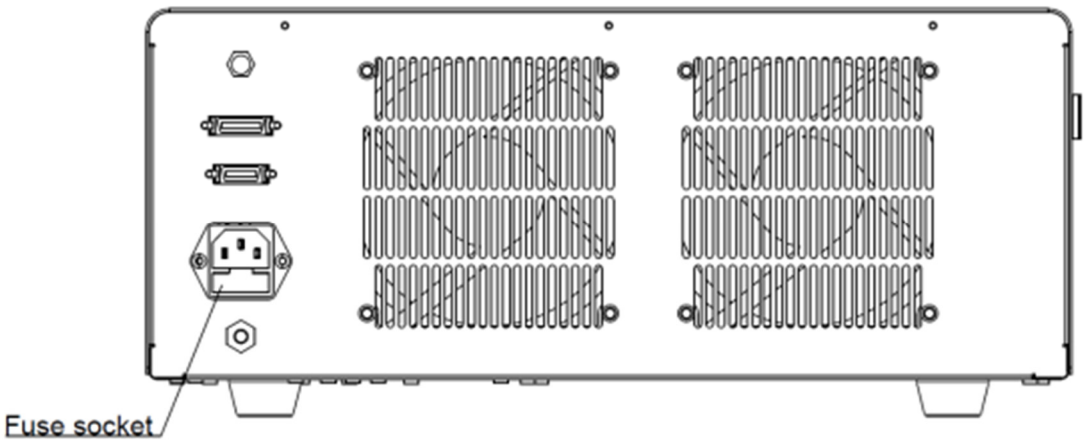


Figure 4.8

3. If the fuse is damaged, replace with a new one.
4. Connect the power cord with light source and turn ON the rear board switch and the power switch. If the fuse is damaged again, turn OFF the power switch and disconnect the power cord from the light source immediately, and contact Aohua.

WARNING

- Ensure the power cord is disconnected before fuse replacement. Otherwise, electric shock may result.
- Never install a fuse that has not been approved by Aohua or not fulfill the required specifications. Damage to the light source, malfunction, electric shock or a fire may result.

4.9 Air pump replacement

When the failure in air feeding or insufficient airflow feeding occurs, defect in related components inside of the air pump may exist. Contact and send the air pump to Aohua to repair or purchase a new one.

04 Operation

4.10 Maintenance, storage and disposal of the light source

4.10.1 Maintenance

Aohua recommends that user and purchase unit conduct the maintenance activities to the light source by following the methods below daily.

CAUTION

- Only authorized users can perform maintenance operations.

1. Keep the light source from water ingression.
2. Do not touch or wipe the lamp by hand.
3. Specifically, the power supply of light source must be reliably grounded. Electric shocks and burns resulted from violating the required procedures are not responsible by Aohua.
4. Contact Aohua for any product quality problems. Aohua is not responsible for any problems and accidents caused by unapproved disassembly activities.
5. Do not cover or block the ventilation grills of the light source, and keep the air flowing.
6. Use a lint-free cloth moistened with alcohol to wipe the power switch. the Otherwise, damage to the switch and/or electric shock may result. Keep the power switch OFF during reprocessing to maintain a normal or even extended service life.
7. Reprocessing of the enclosure

   1. Before reprocessing, ensure that the power cord is disconnected from the light source, and that the power supply plug is dry to avoid electric shock.
   2. Gently wipe the external of the device with a clean and lint-free cloth moistened with alcohol, especially the ventilation grills and the optical fiber terminal. Ensure that these areas are not contaminated by foreign objects and that the air flowing normally. Keep all electric circuit sockets dry. Daily cleaning is recommended.
   3. If any fluid spills on the device, wipe it with a clean and lint-free cloth timely, and ensure that no residual fluids or moistures on the device before operation, especially on the electric circuit sockets. If there are residual moistures at the electric circuit sockets, do not use it until the water has been evaporated.

4.10.2 Storage and disposal

CAUTION

- Before storage, turn OFF the rear board switch and the power switch, and disconnect the power cord from the light source.
- The packaged light source should be stored in a cool and dry room with a relative humidity of no more than 95% and good ventilation, and without corrosive gas, flammable or explosive gas, liquid contamination or chemicals.

The storage environment shall fulfill the following requirements.

1. Ambient temperature : -40°C - +55°C
2. Relative humidity : 10% - 95%
3. Atmospheric pressure : 500hPa - 1060hPa

Comply with relevant waste disposition regulations to dispose the light source and its internal components needed to be discarded.

This symbol on the product or in the instructions means that your electrical and electronic equipment should be disposed at the end of its life separately from your household waste. There are separate collection systems for recycling in the EU. For more information, please contact the local authority.

05 Troubleshooting

5.1 Troubleshooting

WARNING

- If any irregularities are observed or suspected, stop using the light source. Consult Aohua. Otherwise, damages to the operator and/or the patient may result.

If any of the following irregularities is observed, do not use the light source and solve the problem as described in the following table.
If the problem is not included in this section or cannot be resolved by the provided countermeasures, contact the after-sales department of Aohua.

Irregularity description	Cause Analysis	Solution	Remarks
Power switch indicator does not light up	Poor connection in the power inlet.	Ensure the firm connection between the power cord and the power inlet.	N/A
	Mains power supply outage.	Inspect the mains power supply.	N/A
	Fuse has been damaged.	Replace with a new fuse.	Ensure the power supply has been cut OFF.
	Unsecure assemble of the side panel after lamp replacement.	Tighten the screws on the side panel.	N/A

5.2 Returning the light source for repair

CAUTION

- Aohua is not responsible for any injuries to the human or damages to the light source resulted from repair activities attempted by non-Aohua personnel.
- If any spare parts or electronic components of the light source are damaged, only use the spare parts or electronic components approved by Aohua. Aohua is not responsible for any damages caused by using unapproved spare parts or electronic components.

05 Troubleshooting

When returning the light source for repair, send the light source with a description of the malfunction or damage and the name and telephone number of the individual at your site who is the most familiar with the problem. Also, include the warranty card.

06 Other Information

6.1 Manufacture date and service life

1. Product Manufacture Date: refer to the product QC pass label.
2. Expected service life: 5 years.

CAUTION

- Before operation, inspect this instrument daily to ensure all technical requirements are fulfilled. If any nonconformity or damage is observed, contact Aohua.

NOTE

- The warranty period of the light source is 1 year. Besides, the warrantied lamp usage period is 500 hours. The predicted service life of the air pump is 1 year. After replacement, the examination lamp, air pump, fuse and other consumables, can function normally.

Appendix

The EMC information and the warranty card of product are provided in this appendix.

EMC Information

EMI Compliance Table

Phenomenon	Compliance	Electromagnetic environment
RF(Radio frequency) emissions	CISPR 11 Group 1, Class A	Professional healthcare facility environment
Harmonic distortion	IEC 61000-3-2 Class A	Professional healthcare facility environment
Voltage fluctuations and flicker	IEC 61000-3-3 Compliance	Professional healthcare facility environment

Table 1 – Emission

NOTE

- The emission characteristics of this equipment make it suitable for using in industrial environment and hospitals (CISPR 11 class A). If it is used in a residential environment (for which CISPR 11 class B is normally required), this equipment may not perform adequate protection to radio-frequency communication services. The user may need to take mitigation measures, such as relocating or re-orienting the equipment.
- Electromagnetic interference may occur in the vicinity of high-frequency electrosurgical equipment and/or other equipment marked with the following symbol:

EMS Compliance Table

Phenomenon	Basic EMC standard	Electromagnetic environment
		Professional healthcare facility environment
Electrostatic Discharge	IEC 61000-4-2	±8 kV contact ±2kV, ±4kV, ±8kV, ±15kV air
Radiated RF EM field	IEC 61000-4-3	3V/m 80MHz-2.7GHz 80% AM at 1kHz

EMC Information

Phenomenon	Basic EMC standard	Electromagnetic environment
		Professional healthcare facility environment
Proximity fields from RF wireless communications equipment	IEC 61000-4-3	Refer to table 3
Rated power frequency magnetic fields	IEC 61000-4-8	30A/m 50Hz or 60Hz

Table 2 - Enclosure Port

Test frequency (MHz)	Band (MHz)	Immunity test levels
		Professional healthcare facility environment
385	380-390	Pulse modulation 18Hz, 27V/m
450	430-470	FM, ±5kHz deviation, 1kHz sine, 28V/m
710	704-787	Pulse modulation 217Hz, 9V/m
745		
780		
810	800-960	Pulse modulation 18Hz, 28V/m
870		
930		
1720	1700-1990	Pulse modulation 217Hz, 28V/m
1845		
1970		
2450	2400-2570	Pulse modulation 217Hz, 28V/m
5240	5100-5800	Pulse modulation 217Hz, 9V/m
5500		
5785		

Table 3 - Proximity fields from RF wireless communications equipment

EMC Information

Phenomenon	Basic EMC standard	Immunity test levels
		Professional healthcare facility environment
Electrical fast transients/burst	IEC 61000-4-4	±2 kV 100kHz repetition frequency
Surges Line-to-line	IEC 61000-4-5	±0.5 kV, ±1 kV
Surges Line-to-ground	IEC 61000-4-5	±0.5 kV, ±1 kV, ±2 kV
Conducted disturbances induced by RF fields	IEC 61000-4-6	3V, 0.15MHz-80MHz 6V in ISM bands between 0.15MHz and 80MHz 80%AM at 1kHz
Voltage dips	IEC 61000-4-11	0% U_T; 0.5 cycle At 0°, 45°, 90°, 135°, 180°, 225°, 270° and 315°
		0% U_T; 1 cycle and 70% U_T; 25/30 cycles Single phase: at 0°
Voltage interruptions	IEC 61000-4-11	0% U_T; 250/300 cycles

Table 4 – Input a.c. power Port

Phenomenon	Basic EMC standard	Immunity test levels
		Professional healthcare facility environment
Electrical fast transients/burst	IEC 61000-4-4	±1 kV 100kHz repetition frequency
Conducted disturbances induced by RF fields	IEC 61000-4-6	3V, 0.15MHz-80MHz 6V in ISM bands between 0.15MHz and 80MHz 80%AM at 1kHz

Table 5 – Signal input/output parts Port

EMC Information

Phenomenon	Basic EMC standard	Immunity test levels
		Professional healthcare facility environment
Electrostatic Discharge	IEC 61000-4-2	±8 kV contact ±2kV, ±4kV, ±8kV, ±15kV air
Conducted disturbances induced by RF fields	IEC 61000-4-6	3V, 0.15MHz-80MHz 6V in ISM bands between 0.15MHz and 80MHz 80%AM at 1kHz

Table 6 – Patient Coupling Port

WARNING

- Portable RF communications equipment (including peripherals such as antenna cables and external antennas) should be used no closer than 30 cm (12 inches) away any part of the light source, including cables specified by the manufacturer. Otherwise, degradation of the equipment performance may result.
- The AQL-300L is intended for use in professional healthcare facility environment.
- The essential performance of AQL-300L is that:
  live endoscopic image can be observed when the image freezing function is not activated; the endoscopic image can be shown with correct orientation when the equipment works together with the endoscopes;
  When the instructions for this device are strictly followed, the emitted light after connection with the endoscopes shall be photobiological safe.
- Use of this equipment adjacent to or stacked with other equipment should be avoided; improper operation may result.
- Use of accessories, transducers and cables which are not affirmed by the manufacturer may cause degradation of electromagnetic immunity due to the increase of electromagnetic emissions.

Warranty Card of Product

User's Information (fill out it in detail)

User's Name	
Zip Code	
Specific Address	
Product Name	
Purchase Date	
Purchase Place	
Product No.	
Invoice No.	
Telephone	

★*The warranty card must be sent back to Aohua within one month after purchase of this product.*

Shanghai AOHUA Photoelectricity Endoscope Co., LTD.

Warranty policy:

Provide the original invoice (or copy) of the product and contact Aohua. Be sure to send the warranty card of the product within one month after purchasing this product.

Warranty conditions:

Within half year after purchasing, any quality failure of this product is warranted by Aohua free of charge.

The following cases are not covered by the warranty:

1. Any damage caused by the improper operation or storage of the user.
2. Any damage caused by the unauthorized disassembly of the user.

AOHUA

400-921-0114

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