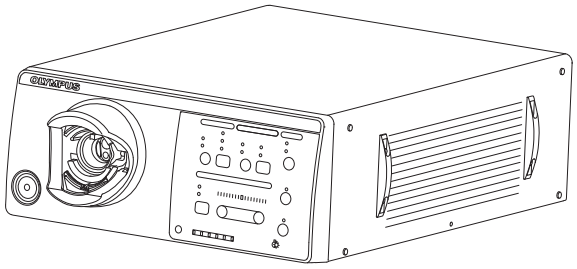
OLYMPUS

INSTRUCTIONS

EVIS EXERA III

EVIS EXERA III XENON LIGHT SOURCE

OLYMPUS CLV-190



USA: CAUTION: Federal law restricts this device to sale by or on the order of a physician.

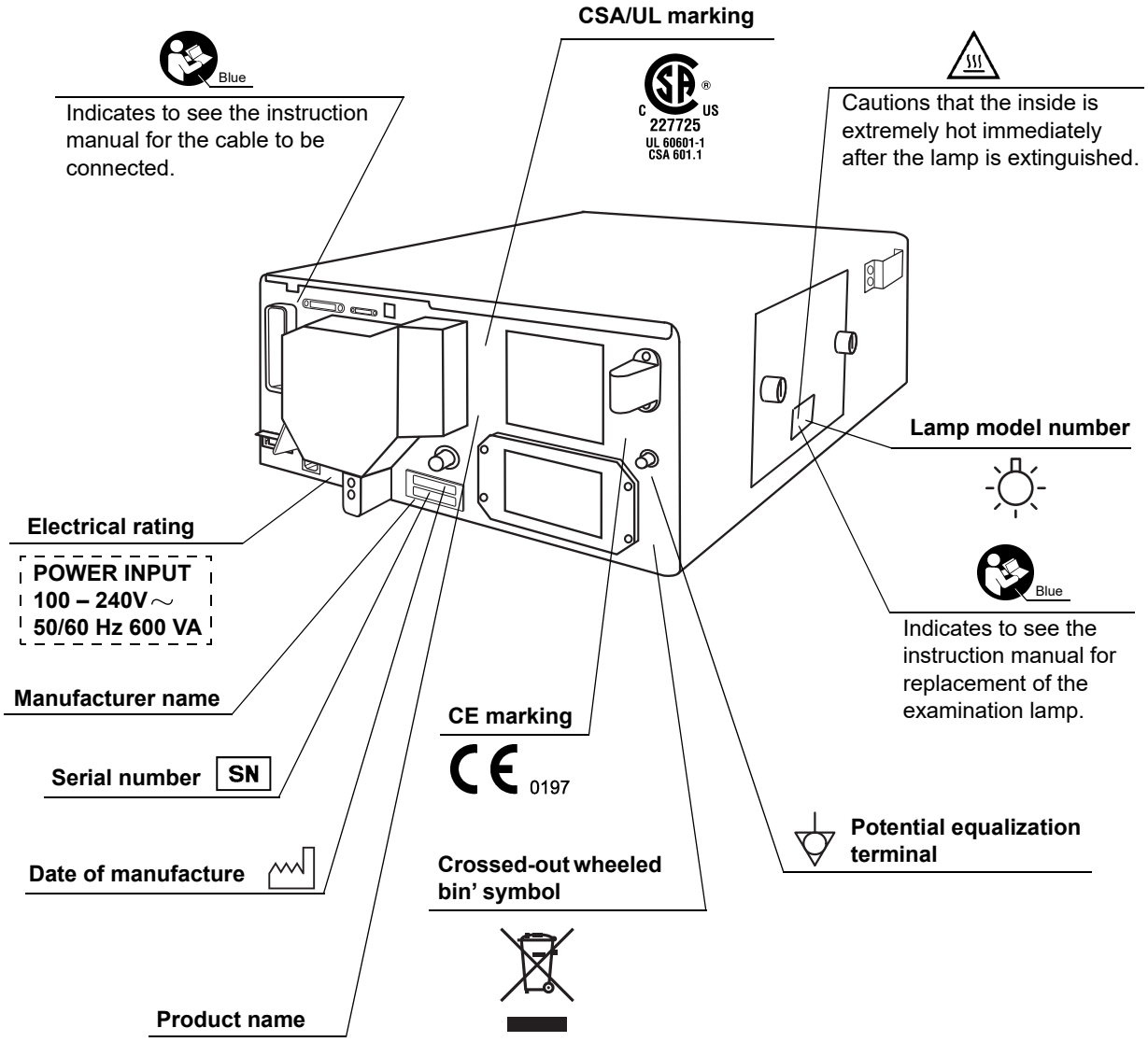
CE 0197

Contents

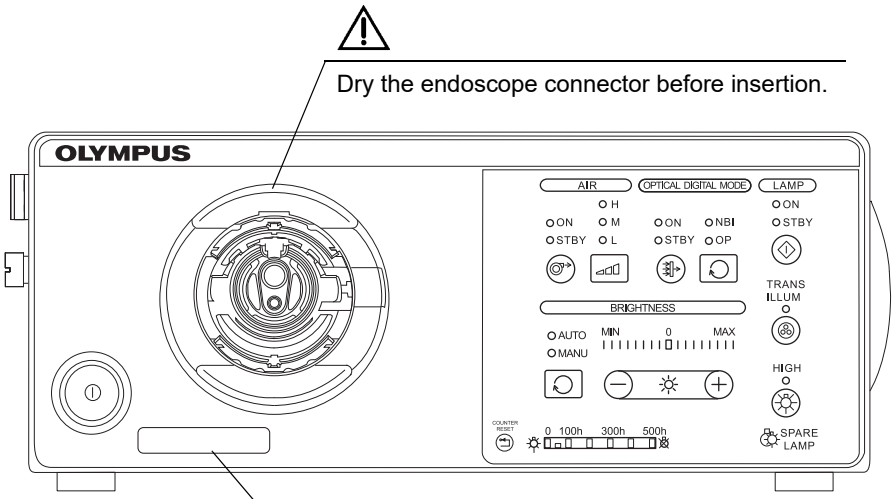
Labels and Symbols

Safety-related labels and symbols are attached to the light source at the locations shown below. If labels or symbols are missing or illegible, contact Olympus.

Rear and side panel



Front panel



Back cover of this instruction manual

Symbol	Description
	Manufacturer
EC REP	Authorized representative in the European Community
	Translation
	Importer (into European Union)

Important Information — Please Read Before Use

Intended use

The light source is intended to be used with Olympus endoscopes, video system centers, and other ancillary equipment for endoscopic diagnosis, treatment and video observation.

Do not use the light source for any purpose other than its intended use.

Applicability of endoscopy and endoscopic treatment

If there are official standards on the applicability of endoscopy and endoscopic treatment that are defined by the hospital's administrators or other official institutions, such as academic societies on endoscopy, follow those standards. Before starting endoscopy and endoscopic treatment, thoroughly evaluate its properties, purposes, effects, and possible risks (their nature, extent and probability). Perform endoscopy and endoscopic treatment only when its potential benefits are greater than its risks.

Fully explain to the patient the potential benefits and risks of the endoscopy and endoscopic treatment as well as any examination/treatment methods that can be performed in its place, and perform the endoscopy and endoscopic treatment only after obtaining the consent of the patient.

Even after starting the endoscopy and endoscopic treatment, continue to evaluate the potential benefits and risks, and immediately stop the endoscopy/treatment and take proper measures if the risks to the patient become greater than the potential benefits.

Instruction manual

This instruction manual contains essential information on using the light source safely and effectively. Before use, thoroughly review this manual and the manuals of all equipment that will be used during the procedure and use the equipment as instructed.

Keep this and all related instruction manuals in a safe, accessible location. If you have any questions or comments about any information in this manual, please contact Olympus.

Terms used in this manual

Video system center:

The video system center is a device that converts signals from a videoscope, video converter, or camera head into monitor images.

Video converter:

The video convertor is a device that connects to a video system center to convert images from a fiber endoscope into monitor images.

Camera head:

The camera head is a device that connects to a video system center to convert images from a fiber endoscope or rigid endoscope into monitor images.

Mobile workstation:

The mobile workstation is a special trolley to place the light source and other devices.

Wall mains outlet:

The wall mains outlet is a wall AC mains power outlet socket having an exclusive terminal for grounding.

Isolation transformer:

The isolation transformer is a safety device that is used to isolate noninsulated equipment with potentially high leakage currents to decrease the possibility of electric shock.

Automatic brightness adjustment:

The automatic brightness adjustment automatically adjusts the intensity of the light emitted from the light source so that the endoscopic image will be maintained at constant brightness even if the distance between the distal end of the endoscope's insertion tube and the subject changes.

Transillumination function:

With this function, the distal end of the endoscope emits more intense examination light, which transmits the body wall of the patient and enables the operator to confirm the position of the distal end from outside the patient's body, provided that the operating room illumination is low.

High intensity mode:

This mode emits brighter illumination light than usual. It is available only with the endoscopes and light guide cables compatible with this mode.

Normal light observation (WLI (White Light Imaging) observation):

This is observation using white light.

Optical-digital observation:

This is observation using specific filtered light.

NBI (Narrow Band Imaging) observation:

This is optical-digital observation using narrow band light.

■ *User qualifications*

If there are official standards for user qualifications to perform endoscopy and endoscopic treatment that are defined by the hospital's medical administrators or other official institutions, such as academic societies on endoscopy, follow those standards. If there are no official qualification standards, the operator of this instrument must be a physician approved by the medical safety manager of the hospital or person in charge of the department (department of internal medicine, etc.).

The physician should be capable of safely performing 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.

■ *Instrument compatibility*

Refer to the "■ System chart" on page 109 to confirm that the light source is compatible with the ancillary equipment being used. Using incompatible equipment can result in patient injury or equipment damage and makes it impossible to obtain the expected functionality.

This instrument complies with the EMC standard for medical electrical equipment, edition 4 (IEC 60601-1-2: 2014).
When connecting to an instrument that complies with a previous edition of the EMC standard for medical electrical equipment edition, the EMC characteristics could be vulnerable.

■ *Repair and modification*

The light source does not contain any user-serviceable parts. Do not disassemble, modify or attempt to repair it; patient or user injury, equipment damage, and/or the impossibility to obtain the expected functionality can result. Some problems that appear to be malfunctions may be correctable by referring to Chapter 8, "Troubleshooting". If the problem cannot be resolved using the information in Chapter 8, contact Olympus. The light source is to be repaired by Olympus technicians only.

■ *Signal words*

The following signal words are used throughout this manual:

DANGER	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
CAUTION	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 or potential equipment damage.
NOTE	Indicates additional helpful information.

■ *Dangers, warnings, and cautions*

Follow the dangers, warnings, and cautions given below when handling the light source. This information is to be supplemented by the dangers, warnings, and cautions given in each chapter.

DANGER

- Strictly observe the following precautions. Failure to do so may place the patient and medical personnel in danger of an electric shock.
  - When the light source 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. Such contact may cause unintended current flow to the patient.
  - If fluids are spilled on or into the light source, stop operation of the light source immediately and contact Olympus.
  - Do not prepare, inspect, or use the light source with wet hands.
- Never install and operate the light source in the following locations. An explosion or fire may result because this video system center is not explosion-proof.
  - The concentration of oxygen is high.
  - Oxidizing agents (such as nitrous oxide (N_2O)) are present in the atmosphere.
  - Flammable anesthetics are present in the atmosphere.
  - Flammable liquids are nearby.

WARNING

- In case of light source failure or malfunction, always keep another light source in the room ready for use.
- Never insert anything into the ventilation grills of the light source. It can cause an electric shock.
- Do not look directly into the distal end of the endoscope, the distal end of the light guide cable, or the output socket of the light source when they are emitting light. The intense light may cause eye injury.
- Do not touch the distal end of the endoscope connector of the endoscope, distal end of the light guide connector of the endoscope, distal end of the light guide cable, or output socket of the light source immediately after disconnecting it from the light source because they are extremely hot. Operator or patient injury can result.

WARNING

- Although the examination light emitted from the endoscope's distal end is required for endoscopic observation and treatment, it may also cause alteration of living tissues, such as protein denaturation of liver tissue and perforation of the intestines through inappropriate use.
  Observe the following warnings about the illumination.
  - Always set the minimum required brightness. The brightness of the image on a video monitor may differ from the actual brightness at the distal end of an endoscope. Especially in combination with endoscopes using an electrical shutter function, pay attention to the brightness level setting of the light source. When the light source is used with a video system center compatible with automatic brightness adjustment function, be sure to use this function. The automatic brightness adjustment can keep the illumination at a proper level. Refer to the instruction manual for the video system center for details.
  - Do not continue observation in the proximity of tissue or keep the distal end of the endoscope in contact with living tissue for a long time.
  - When discontinuing the use of the endoscope, be sure to turn the light source OFF or extinguish the examination lamp by pushing the lamp button.
- Since the light source irradiates strong examination light, the disconnected end of the light guide cable or the distal end of the endoscope becomes very hot. To prevent a fire hazard, do not bring the distal end of the light guide cable or the distal end of the endoscope in contact with a flammable object, such as operating room drapes while the examination lamp is ON. When no examination is performed, be sure to turn the light source OFF or extinguish the examination lamp by pushing the lamp button.
- If the endoscopic image dims during use, blood, mucus, or debris may have soiled the light guide on the distal end of the endoscope. Carefully withdraw the endoscope from the patient and remove the blood or mucus to obtain optimum illumination and to ensure the safety of the examination. If you continue to use the endoscope in such a condition, the distal end temperature may rise and cause mucosal burns. It may also cause patient and/or operator injury.
- The light source may interfere with other medical electronic equipment used in combination with it. Before use, refer to the Appendix to confirm the compatibility of the light source with all equipment to be used.
- Do not use the light source in locations exposed to strong electromagnetic radiation (e.g., in the vicinity of a microwave therapeutic device, MRI, short-wave therapeutic device, radio equipment, or cellular/portable phone). This may impair the performance of the light source.
- Do not touch the output connector of the light source. Operator or patient injury can result.

WARNING

- Do not connect any object other than the light guide and an endoscope to the output connector. Otherwise, malfunction may result.
- Do not rely on the optical-digital observation mode alone for primary detection of lesions or for a decision regarding any potential diagnostic or therapeutic intervention.
- Be sure that the light source is not used adjacent to or stacked with other equipment (other than the components of the light source or system) to avoid electromagnetic interference.
- Electromagnetic interference may occur on the light source near equipment marked with the following symbol or other portable and mobile RF (Radio Frequency) communications equipment, such as cellular phones. If electromagnetic interference occurs, mitigation measures may be necessary, such as reorienting or relocating the light source, or shielding the location.

CAUTION

- Do not use a pointed or hard object to press the buttons on the front panel. This may damage the buttons.
- Do not touch the electrical contacts inside the light source’s connectors.
- Do not simultaneously touch any of the exposed electrical contact pins and the patient. It may pose a risk of electric shock to the patient and/or user.
- Do not apply excessive force to the light source and/or other instruments connected. Otherwise, damage and/or malfunction can occur.
- Do not leave the examination lamp ON when an endoscope is connected to the light source. The examination light reaches the maximum intensity and the endoscope’s distal end becomes hot. In addition, smoke may also be produced if the debris attached to the distal end is heated.
- If the emergency lamp, instead of the examination lamp, lights up frequently when pressing the lamp button to light the examination lamp, the light source may have already malfunctioned. Return the light source for repair, following Section 8.3, “Returning the light source for repair”.
- Avoid using the light source in a dusty environment. This may damage the light source.
- Do not position the medical device so that it is difficult to disconnect it from the wall mains outlet.

NOTE

As defined by the international safety standard (IEC 60601-1), medical electrical equipment is classified into the following types: TYPE CF applied part (the instrument can safely be applied to any part of the body, including the heart), and TYPE B/BF applied part (the instrument can safely be applied to any organ except the heart). The part of the body that an endoscope or electrosurgical accessory can safely be applied to depends on the classification of the equipment to which the instruments are connected. Before beginning the procedure, check the current leakage classification type of each instrument to be used for the procedure. Classification types are clearly specified in the instruments' instruction manuals.

Symbol	Classification
	TYPE CF applied part
	TYPE BF applied part
	TYPE B applied part

■ *Cardiac applications*

DANGER

- Use only the devices listed in the “■ System chart” on page 109 for endoscopic observation or treatment of the heart or areas near the heart. Other combinations of equipment may cause ventricular fibrillation or seriously affect the cardiac function of the patient.
- For cardiac applications, never support the endoscope with a metal surgical arm that is not electrically isolated from the ground. If not isolated, the endoscope will be connected to the ground through the surgical arm and bed, and will conduct unexpected leakage current that may seriously affect the cardiac function of the patient.
- The use of medical devices not specifically designed for cardiac applications may cause ventricular fibrillation or seriously affect the cardiac function of the patient. As specified by the international standard IEC 60601-1, any applied part used for observation or treatment of the heart or areas near the heart must meet “TYPE CF applied part” requirements for low electrical leakage current. When using endoscopes for endoscopic cardiac applications, the applied part requirements include all devices directly connected to the endoscope, such as the light guide cable, camera head, and telescope holder. Each of these devices must individually meet the “TYPE CF applied part” requirements for leakage current limits if they are to be used for cardiac applications.

NOTE

- The OLYMPUS light guide cables and camera heads listed in the “■ System chart” on page 109 (TYPE CF applied part) that are suitable for cardiac applications bear a ♥ mark.
- The Olympus Surgical Holder for Telescope (SH-1) has an electrically isolated arm structure that isolates the endoscope from the ground. This design makes the SH-1 suitable for cardiac applications.

Summary of the Equipment Functions

Some of the functions described below may be unavailable or restricted depending on the combined equipment. For more details, refer to the instruction manuals for the light source and the required ancillary equipment.

❍ Providing the examination light

The light of the examination lamp built into the light source is provided to the endoscope.
→ Section 5.3, “Turning the light source ON and igniting the examination lamp”

❍ Adjusting the examination light

When the light source is used in combination with the video system center, a videoscope, and camera head, the examination light intensity is adjusted automatically. When the light source is used in combination with a fiber endoscope, the examination light intensity has to be adjusted manually.
→ Section 5.5, “Brightness adjustment”

❍ Optical-digital observation

NBI observation is available as an optical-digital observation mode.
→ Section 5.6, “Optical-digital observation”

❍ Transillumination function

The endoscope’s distal end emits the intense light. The light transmits the patient’s body wall so that the operator can confirm the position of the distal end from outside the patient’s body provided that the operating room illumination is low.
→ Section 5.7, “Transillumination function”

❍ Selecting the high intensity mode

Brighter examination light is available when using an endoscope and light guide that are compatible with high intensity mode operation.
→ Section 5.8, “High intensity mode”

Air and water feed

The light source incorporates an air pump and an external water feed tank to feed air and water from the nozzle at the endoscope's distal end into the body cavity, and the air/water flow can be adjusted.
→ Section 5.9, "Air/water feeding"

Monitoring the operating hours of the examination lamp

The lamp usage indicator on the front panel of the light source displays the total accumulated operation hours of the examination lamp to indicate the time for replacement.
→ Section 4.6, "Checking the lamp usage indicator"

Automatic switching to the emergency lamp

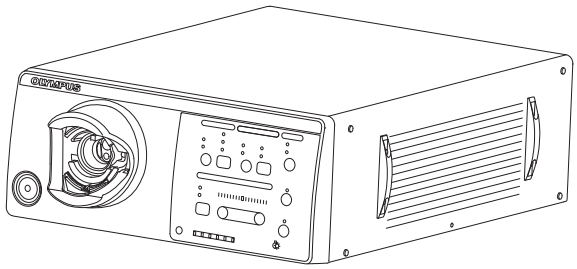
If the examination lamp does not light up or blows in the middle of an examination making endoscopic observation impossible, the light source switches automatically to the emergency light. The emergency light provides enough brightness for withdrawing the endoscope from the patient's body.

Chapter 1 Checking the Package Contents

1.1 Checking the package contents list

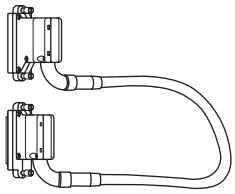
Match all items in the package with the components shown below. Inspect each item for damage. If the light source is damaged, a component is missing, or you have any questions, do not use the light source and immediately contact Olympus.

❍ Light source

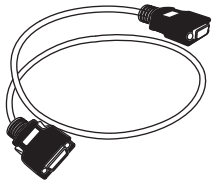


EVIS EXERA III xenon light source (CLV-190)

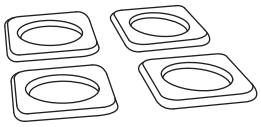
❍ Accessories



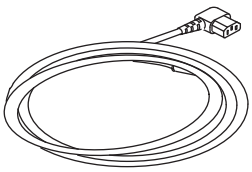
Digital light source cable (MAJ-1933)



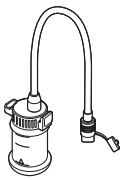
Light source cable (MAJ-1941)



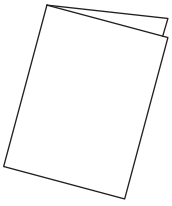
Foot holders (MAJ-1205, 4 pcs.)



Power cord



Water container (MAJ-901)

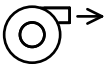


Instruction manual

Chapter 2 Nomenclature and Functions

2.1 Nomenclature and functions

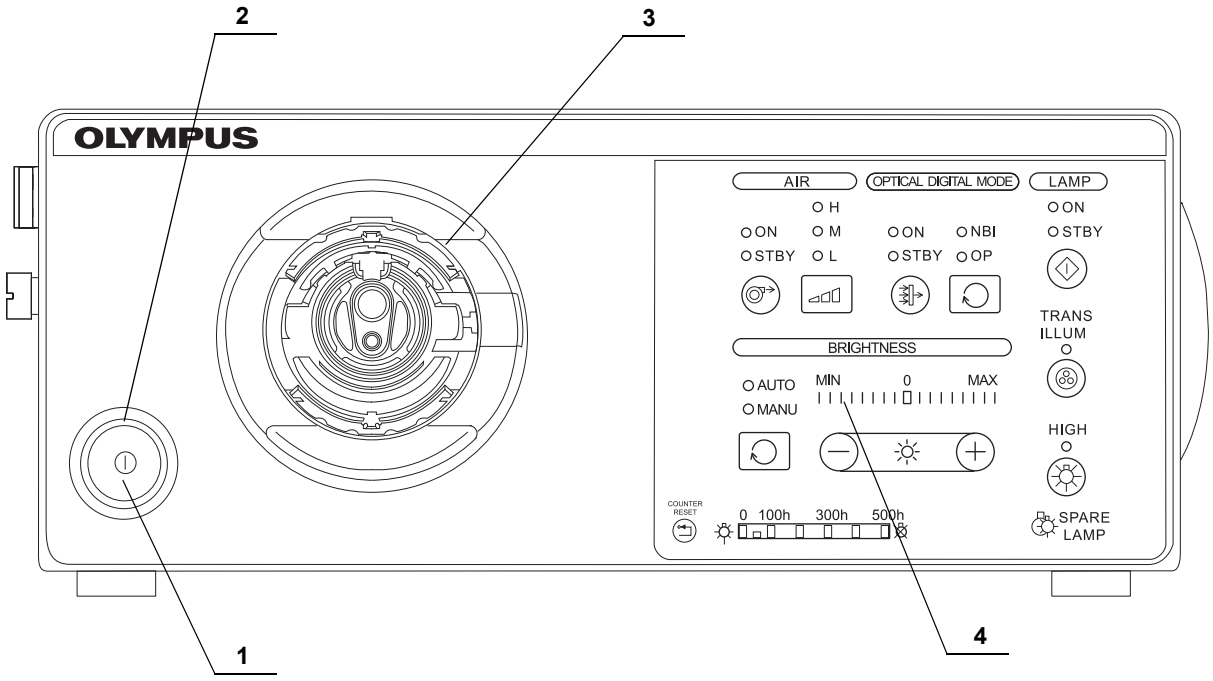
❍ Front panel

Symbol	Description	Symbol	Description
	Power ON/OFF		Brightness
	Decrease brightness		Increase brightness
	Exchange lamp (Lamp usage indicator)		Lamp usage indicator reset
	New lamp (Lamp usage indicator)		Emergency lamp
	Examination lamp ignition		Mode select
	Transillumination		High intensity mode
	Air-feeding		Air pressure control
L	Air pressure low	*M*	Air pressure medium
H	Air pressure high		Observation mode
	Caution	–	–

Rear and side panels

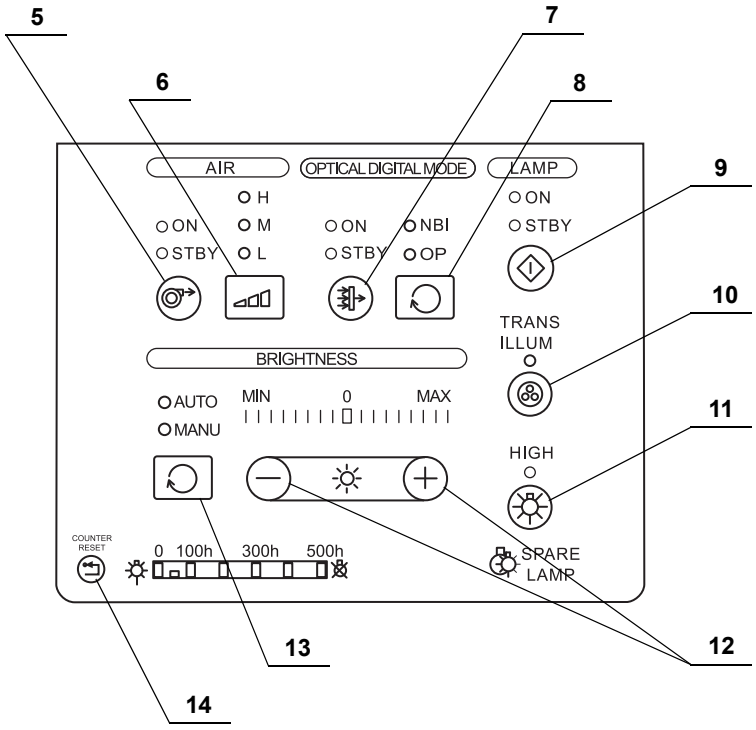
Symbol	Description	Symbol	Description
	Refer to instructions.		Warns that the lamp is hot.
SN	Serial number		Potential equalization terminal
~	Alternating current	–	–

2.2 Front panel



No.	Nomenclature	Description
1	Power switch	Press to turn the light source ON or OFF.
2	Power indicator	Lights up when the light source is ON.
3	Output socket	Connects the endoscope or the light guide cable to this socket. This socket provides light and air to the endoscope.
4	Control panel	Refer to the next page.

Control panel (buttons)

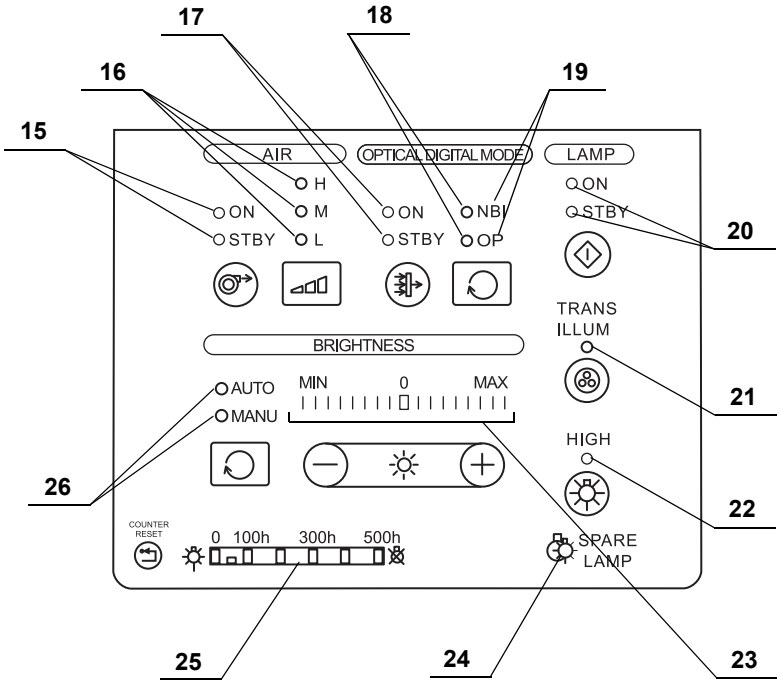


No.	Nomenclature	Description
5	Airflow button	Press this button to start and stop air-feeding to the endoscope's distal end. → Section 5.9, "Air/water feeding"
6	Airflow regulator button	This button is used to control the air being fed to the endoscope. → Section 5.9, "Air/water feeding"
7	Observation mode button	Press to switch the observation modes in turn. → Section 5.6, "Optical-digital observation"
8	Observation mode select button	Press to switch the optical-digital observation modes in turn. → Section 5.6, "Optical-digital observation"
9	Lamp button	Press to turn ON the examination lamp. Press for a longer period while the lamp is ON to turn it OFF. → Section 5.3, "Turning the light source ON and igniting the examination lamp" → Section 5.10, "Extinguishing the examination lamp"
10	Transillumination button	When pressing this button, light emitted from the distal end of the endoscope becomes brighter for 7 seconds. → Section 5.7, "Transillumination function"
11	Intensity mode button	Press this button to switch between the high intensity mode and normal intensity mode. → Section 5.8, "High intensity mode"
12	Brightness buttons	Press these buttons to adjust the brightness. → Section 5.5, "Brightness adjustment"
13	Brightness mode button	Press this button to select automatic or manual brightness adjustment. → Section 5.5, "Brightness adjustment"
14	Counter reset button	Press this button for at least 3 seconds to reset the lamp usage indicator after replacing the examination lamp. → Section 6.4, "Lamp usage indicator reset"

NOTE

Each button on the front panel is active only when it is lighting up. When it is not lighting up, the video system center does not work even if it is pressed.

❍ Control panel (indicators)



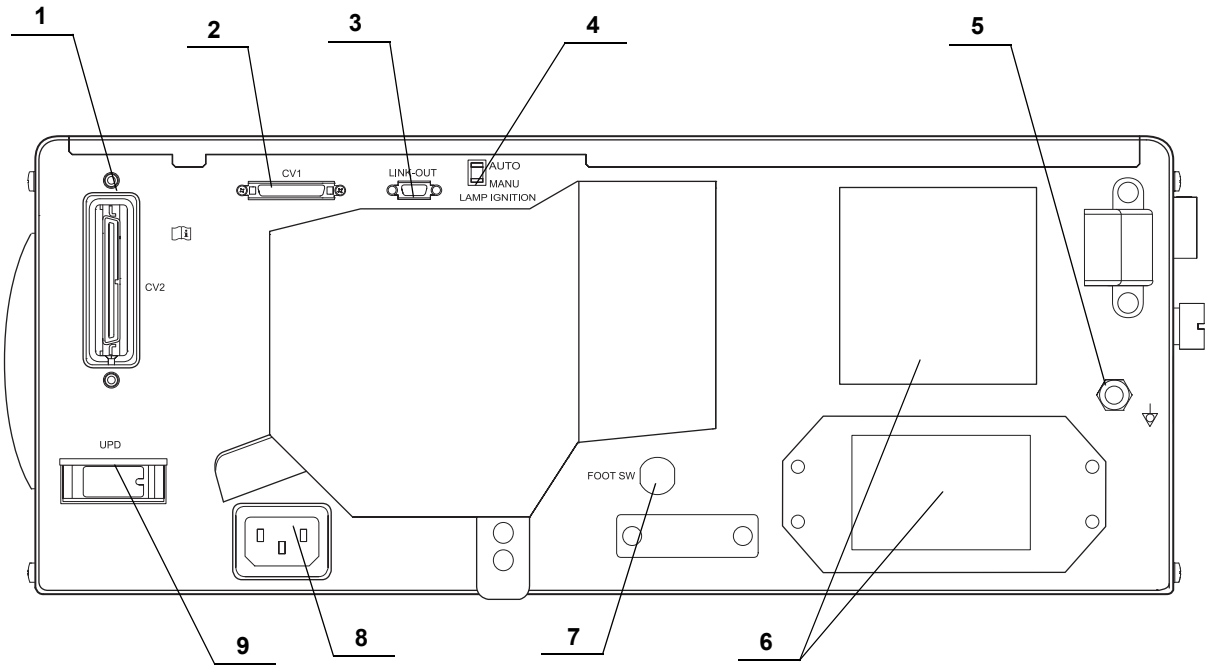
No.	Nomenclature	Description
15	Airflow indicators	These indicators display whether the air-feeding function is activated (“ON”) or not (“STBY”). → Section 5.9, “Air/water feeding”
16	Airflow regulator indicators	These indicators display the current airflow pressure level setting (Low, Medium, or High). → Section 5.9, “Air/water feeding”
17	Observation mode indicators	These indicators display whether NBI observation mode is activated (ON) or in normal white light observation mode (STBY). → Section 5.6, “Optical-digital observation”
18	Observation mode selection indicators	These indicators display which optical-digital observation mode is activated. → Section 5.6, “Optical-digital observation”
19	Available observation mode indicators	These indicators display the optical-digital observation mode available with the connected endoscope. → Section 5.6, “Optical-digital observation”
20	Lamp indicators	These indicators display whether the examination lamp (xenon lamp) lights up (“ON”) or not (“STBY”). → Section 5.3, “Turning the light source ON and igniting the examination lamp” → Section 5.10, “Extinguishing the examination lamp”
21	Transillumination indicator	This indicator lights up when the transillumination function is activated. → Section 5.7, “Transillumination function”
22	High intensity mode indicator	This indicator lights up when the high intensity mode is selected. → Section 5.8, “High intensity mode”
23	Brightness indicator	These indicators display the current brightness. → Section 5.5, “Brightness adjustment”
24	Emergency lamp indicator	This indicator lights up when the emergency lamp (halogen) is in use and blinks when the emergency lamp (halogen) is broken, disconnected, or not mounted. → Section 4.5, “Inspection of the power supply” → Section 4.7, “Inspection of the examination light”
25	Lamp usage indicator	This indicator displays the total working hours of the examination (xenon) lamp. → Section 4.6, “Checking the lamp usage indicator”
26	Brightness mode indicators	These indicators display the brightness adjustment setting (“AUTO” or “MANU”). → Section 5.4, “Setting the brightness mode”

NOTE

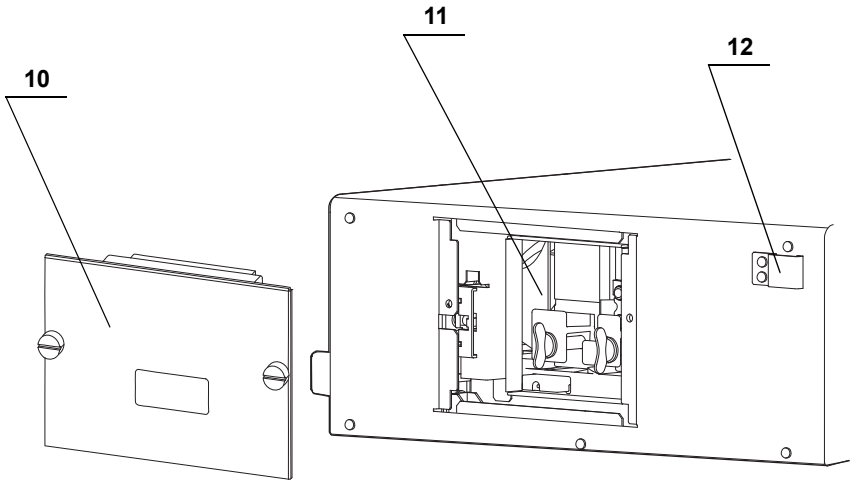
- When the light source is turned ON with no endoscopes connected to the light source, the airflow indicator "STBY"may blink.
- When the light source is turned ON with no endoscopes connected to the light source, the lamp indicator "STBY" may blink.

2.3 Rear and side panels

❍ Rear panel



❍ Side panel



No.	Nomenclature	Description
1	CV2 terminal	This terminal is the receptacle for the digital light source cable (MAJ-1933) for use with the video system center. → Section 3.6, “Connection of the video system center”
2	CV1 terminal	This terminal is the receptacle for the light source cable (MAJ-1941) for use with the video system center. → Section 3.6, “Connection of the video system center”
3	LINK-OUT terminal	This terminal is the receptacle for the communication cable (MAJ-1942, MAJ-1948) for use with the endoscope position detecting unit or endoscopic surgical system. See the instruction manual for the video system center connected to the light source.
4	Lamp ignition mode switch	Press this switch to select between automatic or manual ignition of the examination lamp. → Section 3.5, “Selection of the lamp ignition mode”
5	Potential equalization 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 are equalized.
6	Ventilation grills	The air in the light source is exhausted from the grills for cooling.
7	Foot switch terminal	This terminal is the receptacle for the foot switch (MAJ-1391). → Section 3.7, “Connection of the foot switch”
8	AC power inlet	Connect the provided power cord to supply the AC power via this inlet. → Section 3.8, “Connection to the AC mains power supply”
9	UPD terminal	The terminal is the receptacle for the CLV-UPD cable (MAJ-1898) for use with the endoscope position detecting unit. See the instruction manual for the video system center connected to the light source.
10	Lamp cover	This cover has to be removed to replace the examination lamp. → Section 6.2, “Removal of the lamp”
11	Lamp chamber	The lamp is inserted to this chamber.
12	Water container holder	This holder is used for the installation of the water container. → Section 3.4, “Installation of the water container”

Chapter 3 Installation and Connection

Prepare the light source and compatible equipment (shown in the "■ System chart" on page 109) 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 Precautions for installation and connection

WARNING

Review this chapter thoroughly and prepare the instruments properly before use. If the equipment is not properly prepared before each use, equipment damage, patient and operator injury, and/or a fire can occur.

CAUTION

- Turn OFF all system components before connecting them. Otherwise, equipment damage or malfunction can result.
- Use appropriate cables only. Otherwise, equipment damage or malfunction can result.
- Properly and securely connect all cables. If the cable connector has connection screws, tighten up the screws. Otherwise, equipment damage or malfunction can result.
- The cables should not be sharply bent, pulled, twisted, or crushed. Cable damage can result.
- Never apply excessive force to connectors. This could damage the connectors.
- Use the light source only under the conditions described in, "Transportation, storage, and operating environments" on page 113 and, "Specifications" on page 113 in the Appendix. Improper performance, compromised safety and/or equipment damage may result.

3.2 Installation workflow

Please see the installation workflow below. Follow each step of the workflow before using the light source and the ancillary equipment.

1	**Install the light source and the ancillary equipment on the mobile workstation or another stable location.** **→Section 3.3 on page 29**
2	**Install the water container.** **Only if air/water feeding function is used.** **→Section 3.4 on page 33**
3	**Select the lamp ignition mode.** **→Section 3.5 on page 33**
4	**Connect the light source to the video system center.** **(Only if the video system center is used.)** **→Section 3.6 on page 35**
5	**Connect the foot switch.** **(Only if the footswitch is used.)** **→Section 3.7 on page 38**
6	**Connect the light source to the power supply.** **→Section 3.8 on page 39**

3.3 Installation of equipment

CAUTION

- Do not place any equipment other than the video system center on the top of the light source. Equipment damage can result.
- Keep the ventilation grills of the light source clear. The ventilation grills are located on the rear panels. Blockage can cause overheating and equipment damage.
- Clean and vacuum dust the ventilation grills using a vacuum cleaner. Otherwise, the light source may break down and gets damaged from overheating.
- Place the light source on a stable, level surface using the foot holders (MAJ-1205). Otherwise, the light source may topple down or drop, and operator or patient injury may occur, or equipment damage can result.
- When using the mobile workstation, confirm that excessive force is not applied to the cord of the workstation. The cord may be disconnected, and malfunction can result.
- If a trolley other than the mobile workstation (WM-NP2, WM-DP2, WM-NP1, WM-WP1, or WM-DP1) is used, confirm that the trolley can withstand the weight of the equipment installed on it.
- Do not install the light source in locations exposed to strong electromagnetic radiation (e.g., in the vicinity of a microwave therapeutic equipment, MRI, short-wave therapeutic equipment, radio equipment, or cellular/portable phones). Otherwise, the light source may malfunction.

■ *Installation on the mobile workstation (WM-NP2, WM-DP2, WM-NP1, WM-WP1, or WM-DP1)*

1 Place the mobile workstation on a level surface. Lock the caster brakes by pushing them down as shown in Figure 3.1.

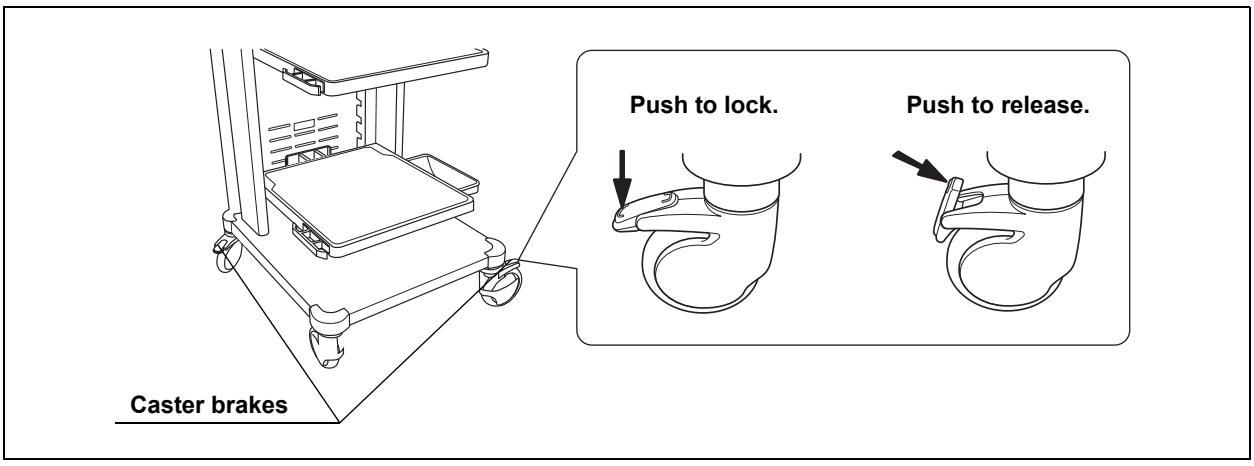


Figure 3.1

2 According to the combination of equipment, install the shelf of the mobile workstation as described in the mobile workstation's instruction manual.

3 For WM-NP2, WM-DP2
Peel the paper from the back of the four foot holders of the light source. Place the foot holders to the four corresponding positions on the rear and attach them lightly.

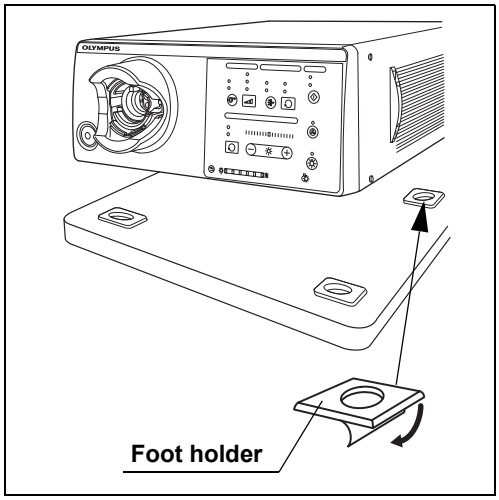


Figure 3.2

4 For WM-NP1, WM-WP1, WM-DP1
Align the two front feet of the light source with the anti-slip projections on the mobile shelf of the mobile workstation.

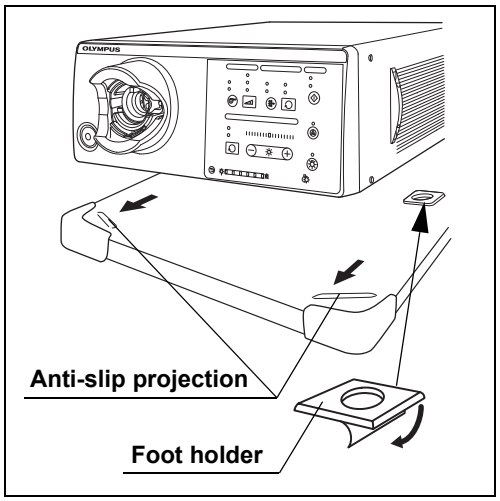


Figure 3.3

5 For WM-NP1, WM-WP1, WM-DP1
Peel the paper from the back of the two foot holders of the light source. Place the foot holders to the two corresponding positions on the rear and attach them lightly. (See Figure 3.3)

NOTE

If the light source is placed on a mobile workstation, only two foot holders are necessary.

6 Remove the light source from the mobile workstation and attach the foot holders firmly.

7 Place the light source on the mobile shelf so that the rear feet fit into the foot holders.

■ *Installation in another location*

1 Place the pattern sheet and the foot holders at the installation location. Peel the paper from the bottom of the foot holders and lightly attach the foot holders to the sheet.

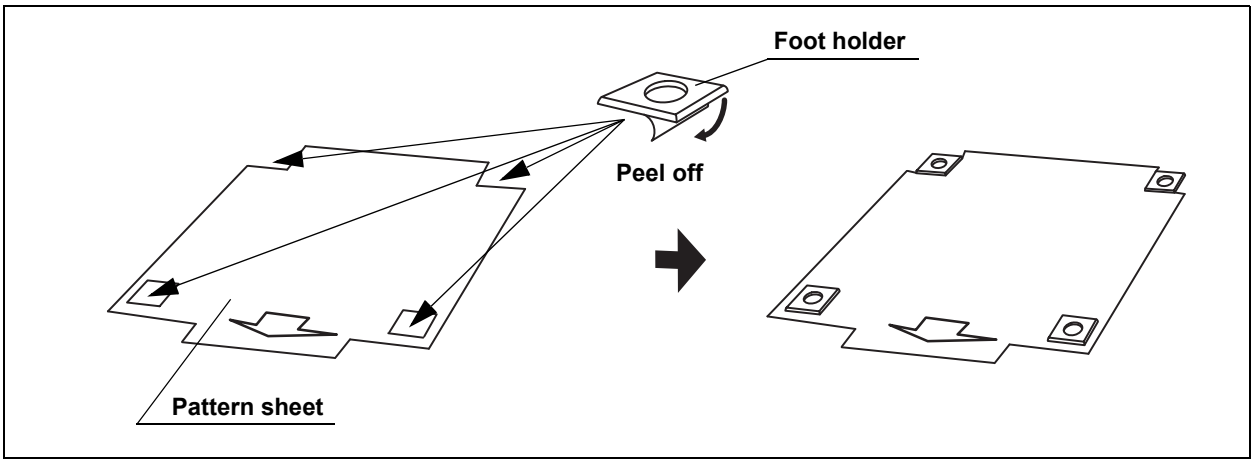


Figure 3.4

2 Place the light source on the pattern sheet and check that the feet fit into the foot holders.

3 Remove the light source from the pattern sheet.

4 Remove the pattern sheet and attach the foot holders firmly.

5 Place the light source so that the feet of the light source fit into the foot holders.

3.4 Installation of the water container

When using an endoscope having the water feeding function, prepare the water container as shown in the "■ System chart" on page 109. Install the water container at the water container holder on the left side of the light source.

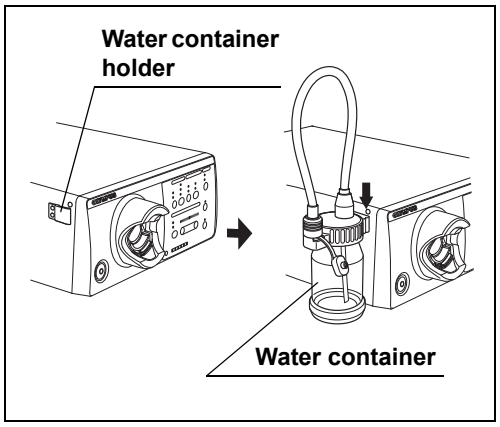


Figure 3.5

3.5 Selection of the lamp ignition mode

Either manual or auto ignition mode can be selected to ignite the examination lamp. Select either of modes and set as follows:

- Manual ignition

  The examination lamp ignites by pushing the lamp ignites button after turning the light source ON.

- Auto ignition

  The examination lamp ignites at the same time when turning the light source ON.

NOTE

The factory default setting is manual ignition.

■ *Manual ignition (MANU)*

Set the lamp ignition mode switch on the rear panel to “MANU”.

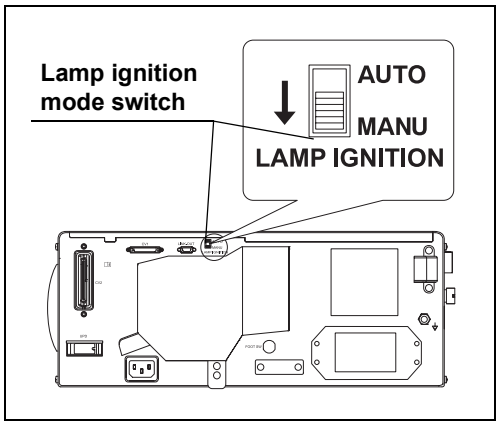


Figure 3.6

■ *Automatic ignition (AUTO)*

Set the lamp ignition mode switch on the rear panel to “AUTO”.

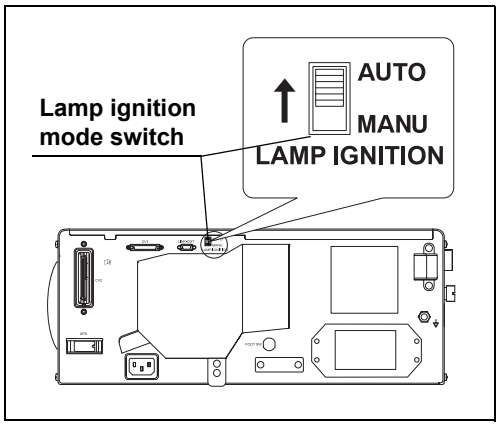


Figure 3.7

3.6 Connection of the video system center

Connect the video system center (CV-190) to the light source using the cables listed below.

Model	Product name
MAJ-1933	Digital light source cable
MAJ-1941	Light source cable

Table 3.1

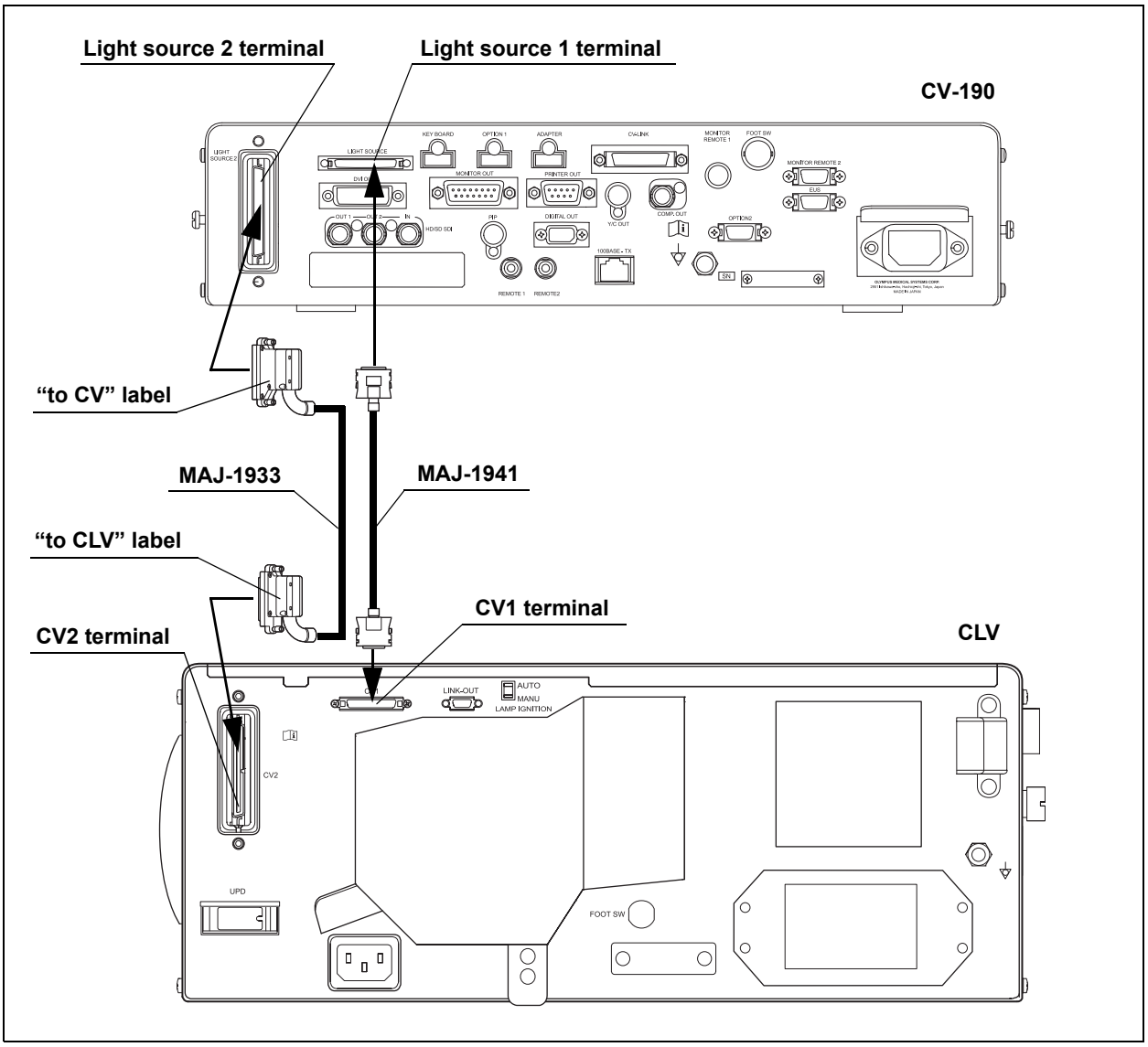


Figure 3.8

Connect the video system center (CV-S190) to the light source using the cables listed below.

Model	Product name
MAJ-1941	Light source cable

Table 3.2

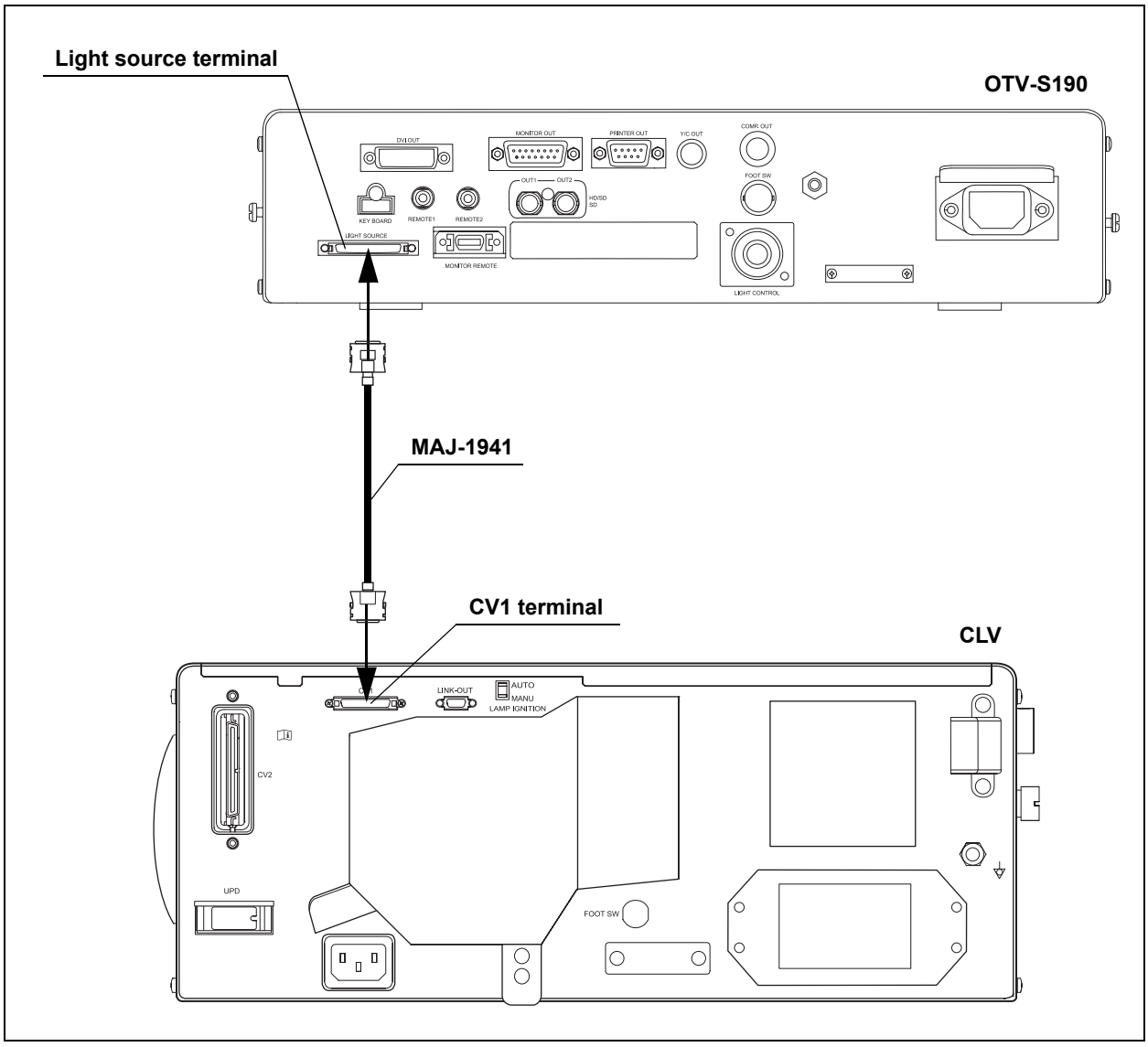


Figure 3.9

CAUTION

Bring the connected image cable into line with the rear panels as shown in Figure 3.10.

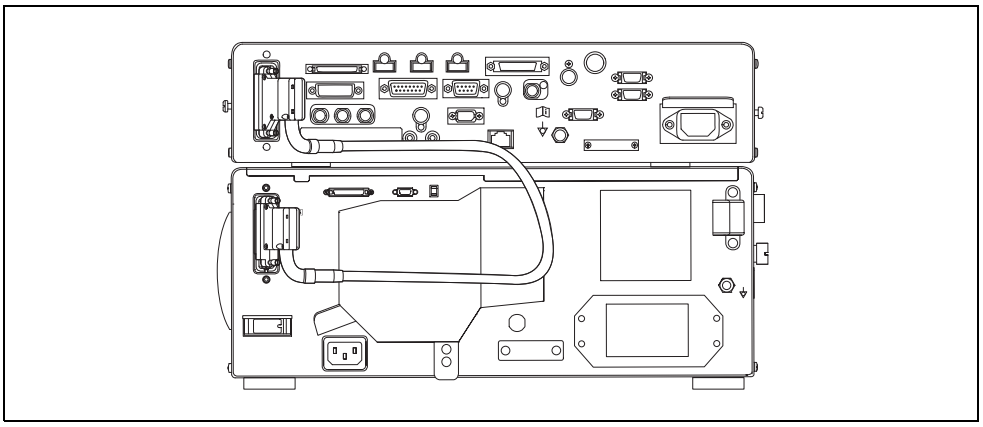


Figure 3.10

3.7 Connection of the foot switch

Connect the foot switch (MAJ-1391, optional) to the foot switch terminal.

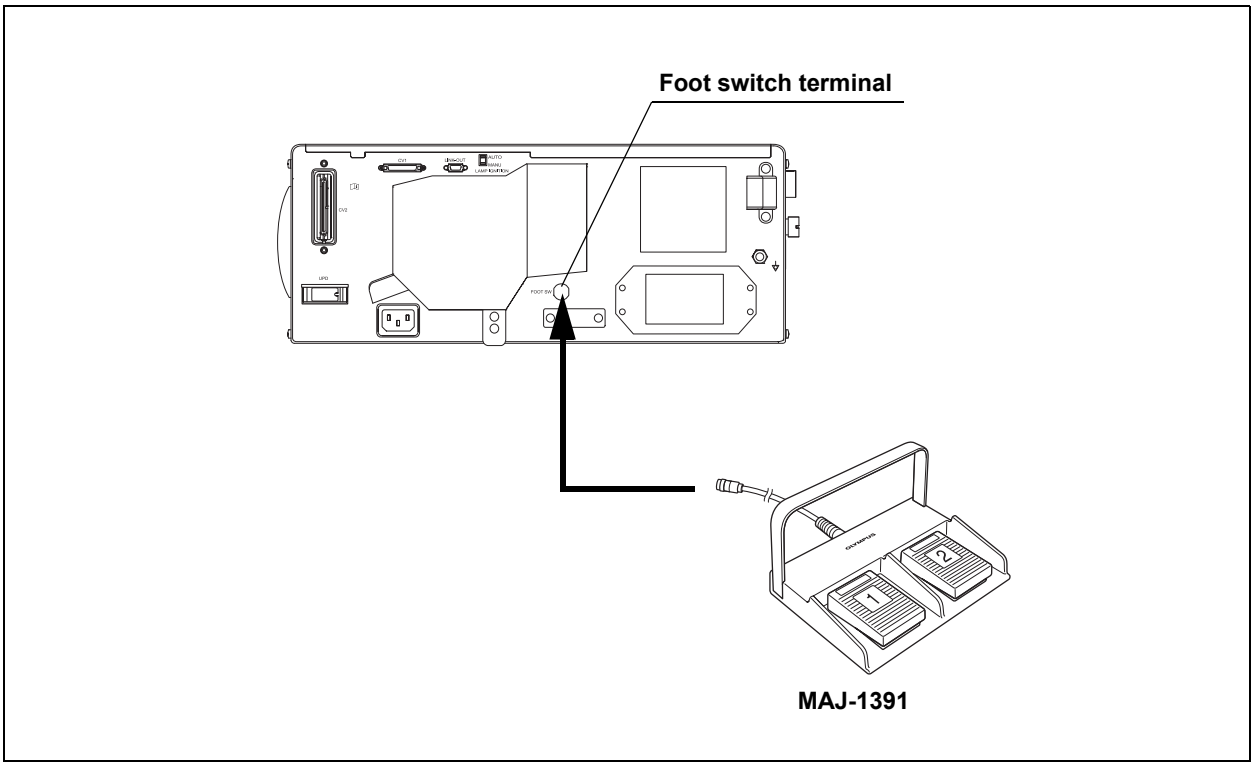


Figure 3.11

NOTE

- If the foot switch is connected to the light source and the video system center is ON, the function of the foot switch depends on the setting of the video system center.
- Two foot switches can be used if they are connected to the video system center and light source respectively.

3.8 Connection to the AC mains power supply

DANGER

- Be sure to connect the power plug of the power cord directly to the mobile workstation (WM-NP2, WM-DP2, WM-NP1, or WM-WP1) or a protective earthed wall mains outlet. If the light source is not protective earthed properly, it can cause an electric shock.
- Do not connect the power plug to a 2-pole power circuit with a 3-pole to 2-pole adapter. It can prevent proper grounding and cause an electric shock.
- Do not connect the power plug using an extension cord. It can prevent proper grounding and cause an electric shock.

WARNING

- Always keep the power plug dry. A wet power plug may cause electric shocks.
- Confirm that the hospital-grade wall mains outlet to which the light source is connected has adequate electrical capacity that is larger than the total power consumption of all connected equipment. If the capacity is insufficient, a fire can result, or the circuit breaker may trip, and it may turn OFF not only the light source but also all other equipment connected to the same power circuit.
- When using the mobile workstation, confirm that the mobile workstation has adequate electrical capacity that is larger than the total power consumption of all connected equipment. If the capacity is insufficient, drop in the supply voltage can result or the electric protective device may trip and turn OFF all the equipment connected to the mobile workstation.
- Do not bend, pull, or twist the power cord. Equipment damage including separation of the power plug and disconnection of the cord wire as well as an electric shock can result.
- Be sure to connect the power plug securely to prevent unintentional disconnection during use. The equipment will not function.
- Do not extend a single wall mains outlet into multiple outlets for simultaneous connection of both the electrosurgical unit and light source. Malfunction of the equipment may result.

1 Confirm that the power switch is not pressed in.

2 Connect the power cord to the AC power inlet of the light source and to the mobile workstation (WM-NP2, WM-DP2, WM-NP1, or WM-WP1) or the wall mains outlet.

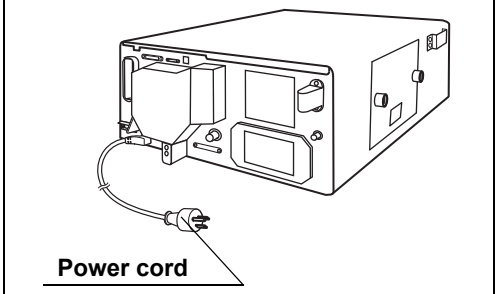


Figure 3.12

NOTE

The plug of the power cord that follows the equipment may vary from this drawing, as in each country the commercialized cable is in accordance to the local applicable norm.

Chapter 4 Inspection

Inspect the light source and other equipment to be used with the light source. Refer to the respective instruction manuals for each piece of equipment.

4.1 Precautions for inspection

WARNING

- Review Chapter 3, “Installation and Connection” thoroughly, and prepare the instruments properly before inspection.
  If the equipment is not properly prepared before each use, equipment damage, patient and operator injury can result.
- Before each procedure, inspect the light source as instructed below. Should any irregularity be observed, do not use the light source and see Chapter 8, “Troubleshooting”. If the light source with any irregularity is used, the light source may malfunction or be damaged, and an electric shock and/or burns can result.
- Inspect other equipment to be used with the light source as instructed in their respective instruction manuals. Should any irregularity be observed, do not use the equipment and see Chapter 8, “Troubleshooting”. If equipment with any irregularity is used, the equipment may malfunction or be damaged, and an electric shock, burns, and/or a fire can result.
- Do not leave the examination lamp ON before and/or after inspection. The temperature of the distal end of the endoscope may rise and cause patient and/or operator injury.

4.2 Inspection workflow

Follow each step of the workflow for inspection of the light source before use.

1 **Check the lamp ignition mode.**
→Section 4.3 on page 43

2 **Connect an endoscope.**
→Section 4.4 on page 43

3 **Confirm that the light source is turned ON normally.**
→Section 4.5 on page 46

4 **Check the total accumulated operating hours of the examination lamp.**
→Section 4.6 on page 48

5 **Confirm that the examination lamp turns ON/OFF normally.**
→Section 4.7 on page 48

6 **Check the brightness mode.**
→Section 4.8 on page 50

7 **Inspect the necessary functions (dependent upon the endoscope).**

- Brightness level→Section 4.9 on page 51
- Optical-digital observation→Section 4.10 on page 56
- Transillumination→Section 4.11 on page 58
- High intensity mode→Section 4.12 on page 59
- Air and water feed→Section 4.13 on page 62

8 **After inspection**
Turn the examination lamp OFF if the light source will not be used immediately.
→Section 4.14 on page 64

4.3 Checking the lamp ignition mode

Check the lamp ignition mode setting, manual ignition or auto ignition (refer to Section 3.5, “Selection of the lamp ignition mode”).
The factory default setting is the manual ignition.

4.4 Connection of an endoscope

WARNING

- Do not look directly into the distal end of the endoscope, the distal end of the light guide cable, or the output socket of the light source when they are emitting light. The intense light may cause eye injury.
- Use compatible endoscopes only. Using an incompatible endoscope can result in patient injury and/or equipment damage. Refer to the “■ System chart” on page 109 for the compatible endoscope to be used with the light source.
- If the surface of the endoscope and light guide cable is dirty, reprocess it according to the directions given in the endoscope’s instruction or reprocessing manual before connecting it to the light source. Otherwise, it may cause patient injury, equipment damage, and/or improper illumination.
- Since the light source irradiates strong examination light, the disconnected end of the light guide cable or the distal end of the endoscope becomes very hot. To prevent a fire hazard, do not bring the disconnected end of the light guide cable or distal end of the endoscope in contact with a flammable object, such as operating room drapes when the examination lamp is turned ON.
- Do not touch the distal end of the endoscope connector of the endoscope, distal end of the light guide connector of the endoscope, distal end of the light guide cable, distal end of the light guide cable’s connector, or output socket of the light source immediately after disconnecting it from the light source because they are extremely hot. Operator or patient injury can result.
- Before connecting the endoscope connector to the light source, confirm that the endoscope connector, including the electrical contacts, is completely dry and foreign objects such as detergent remnants, hard water residue, finger grease, dust, and lint are not on the electrical contacts. If the endoscope is used with wet and/or dirty electrical contacts, the endoscope and light source may malfunction.

Connection of a rigid endoscope

WARNING

Connect equipment in the order described below. Otherwise, the light emitted from the distal end of the light guide cable may cause operator and/or patient injury or a fire by igniting flammable material, such as an operating room drape.

1. Inspect the light guide cable and rigid endoscope as described in the endoscope's instruction manuals.
2. Connect the light guide cable to the rigid endoscope.
3. Insert the light guide connector into the output socket on the front panel of the light source until it clicks.

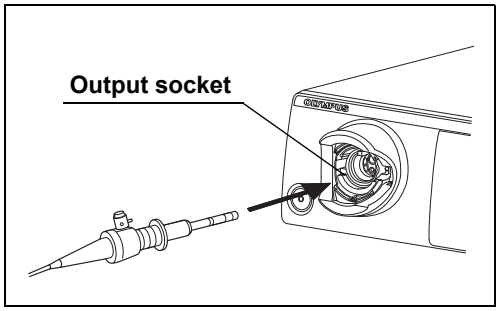
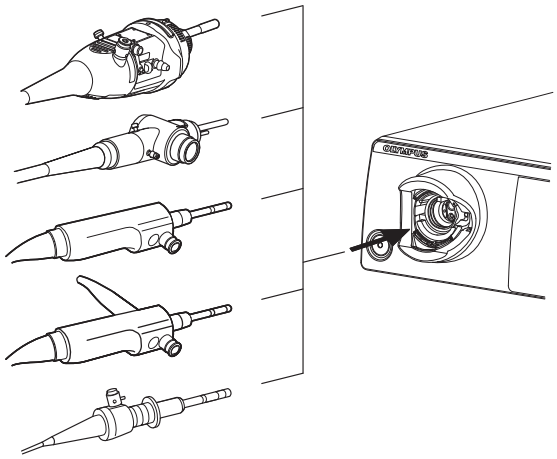


Figure 4.1

❍ Connection of a flexible endoscope

1 Inspect the endoscope as described in the endoscope's instruction manual.

2 Insert the endoscope connector or light guide connector into the output socket on the front panel of the light source until it clicks.



The connector design varies depending on the endoscope model.

Figure 4.2

3 Connect the videoscope cable and water container to the endoscope as described in the endoscope's instruction manual.

4.5 Inspection of the power supply

Confirm that the ventilation grills are not covered with dust, that the lamp cover is attached, and that the light source is turned ON.

WARNING

If auto ignition is active, turning ON the light source ignites the examination lamp automatically. 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 side and rear panels of the light source are not covered with dust or other materials.
2. Confirm that the lamp cover is attached firmly.

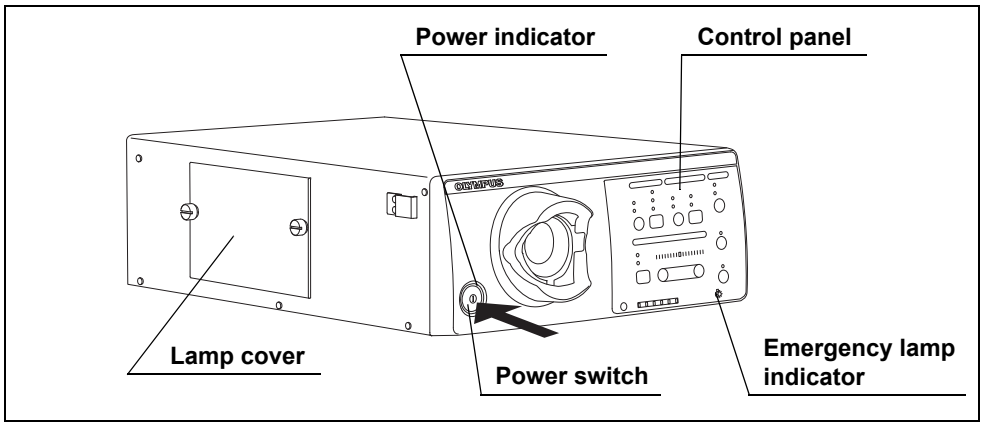


Figure 4.3

NOTE

For safety reasons, incorrect attachment of the lamp cover prevents the light source from being turned ON.

3. Press the power switch of the light source. (See Figure 4.3)
4. Confirm that the power indicator lights up. (See Figure 4.3)
5. Confirm that the emergency lamp indicator on the control panel is not ON or blinking. (See Figure 4.3)
6. Confirm that air is exhausted by holding your hand in front of the ventilation grills on the rear panel.

WARNING

If air is not being exhausted through the ventilation grills, do not use the light source and contact Olympus.

If the power fails to turn ON

Turn the light source OFF. Then, confirm that the power cord is connected firmly and that the lamp cover is firmly closed. Then, turn the light source ON again. If the power fails to turn ON, contact Olympus.

If the emergency lamp indicator on the control panel lights up

Turn the light source OFF and then ON again and try to ignite the examination lamp again. If the emergency lamp indicator still lights up, replace the examination lamp with a new one as described in Section 6.1, “Replacement of the examination (xenon) lamp”. If, after following the steps above, the emergency lamp indicator continues to light up, contact Olympus.

NOTE

When the light source is turned ON in the auto ignition mode, or when the lamp button is pressed while the examination lamp is OFF, the examination lamp will be turned ON within 5 seconds automatically. If ignition fails, the light source automatically switches to the emergency lamp and the emergency lamp indicator lights up.

If the emergency lamp indicator on the control panel blinks

The emergency lamp is damaged. Stop use and contact Olympus.

If the indicators on the control panel light up or blink

The light source is not working properly. Stop use and contact Olympus.

4.6 Checking the lamp usage indicator

Check the lamp usage indicator. When the “500 h” indicator on the lamp usage indicator lights up, replace the examination lamp with a new one as described in Section 6.1, “Replacement of the examination (xenon) lamp”.

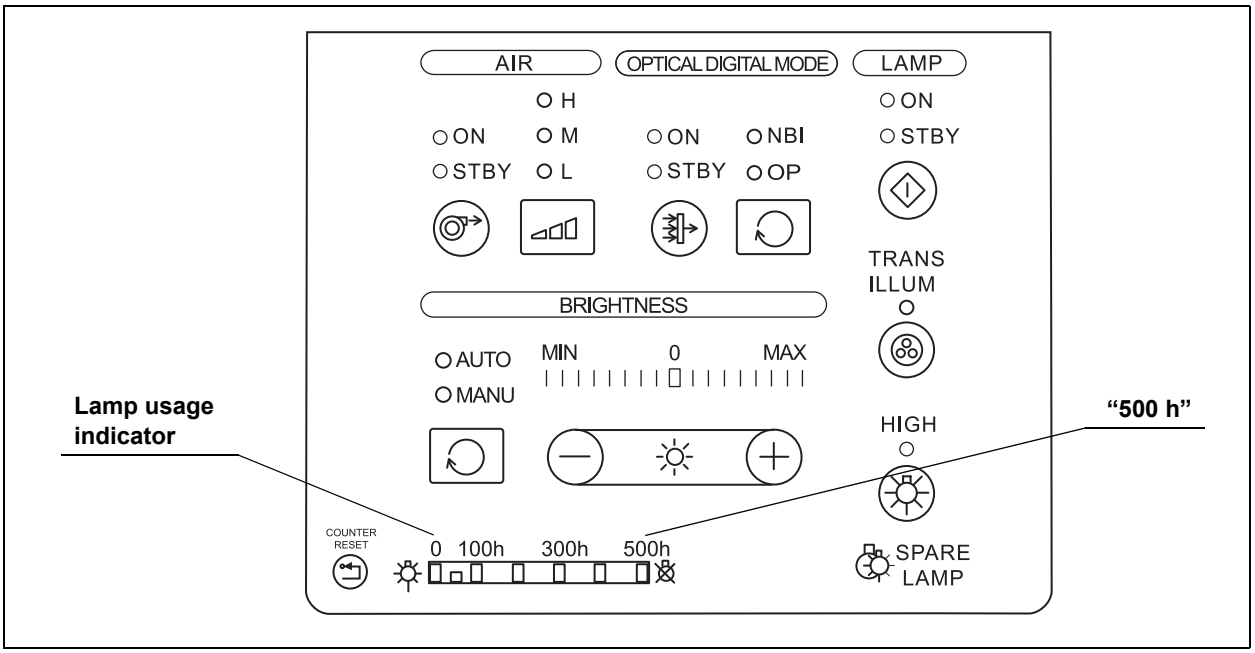


Figure 4.4

NOTE

The lamp usage indicator displays the total operating hours of the examination (xenon) lamp (e.g., “500 h” means 500 hours).

4.7 Inspection of the examination light

WARNING

Do not look directly into the distal end of the endoscope, the distal end of the light guide cable, or the output socket of the light source when they are emitting light. The intense light may cause eye injury.

1 Press the lamp button if the examination lamp is in standby and confirm that the lamp indicator “ON” lights up.

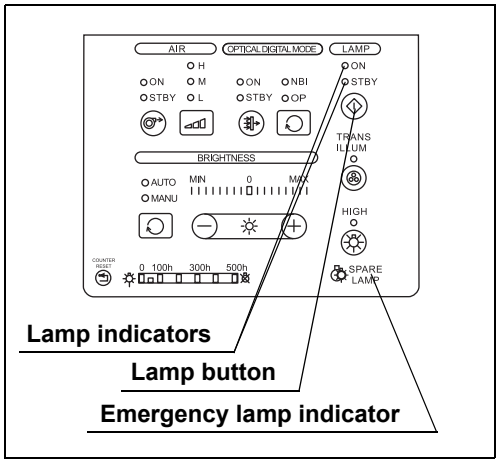


Figure 4.5

2 Confirm that the emergency lamp indicator on the control panel is not lighting or blinking. (See Figure 4.5)

3 Confirm that the examination light is emitted from the distal end of the endoscope (see Figure 4.5). When the lamp light intensity decreases even if the “500 h” indicator does not light up, replace the examination lamp with a new one as described in Section 6.1, “Replacement of the examination (xenon) lamp”.

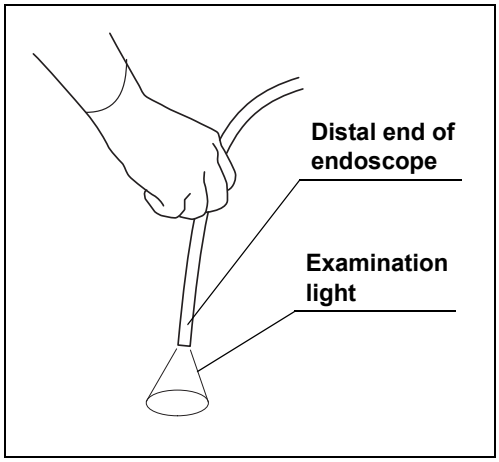


Figure 4.6

4 Press and hold the lamp button for about 1 second: the lamp indicator “STBY” lights up. (See Figure 4.5)

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

If the emergency lamp indicator on the control panel lights up

When the light source is turned ON in the auto ignition mode, or when the lamp button is pressed while the examination lamp is OFF, the examination lamp will be turned ON within 5 seconds automatically. If ignition fails, the light source automatically switches to the emergency lamp and the emergency lamp indicator lights up.

4.8 Inspection of the brightness mode selection function

Confirm that the brightness mode can be switched between “AUTO” and “MANU”.

CAUTION

When using a fiber endoscope or a rigid endoscope without a video converter or camera head, set the brightness mode to “MANU”. Setting it to “AUTO” does not enable the automatic brightness adjustment, and the brightness may not be adequate.

1 Confirm that the brightness mode button lights up.

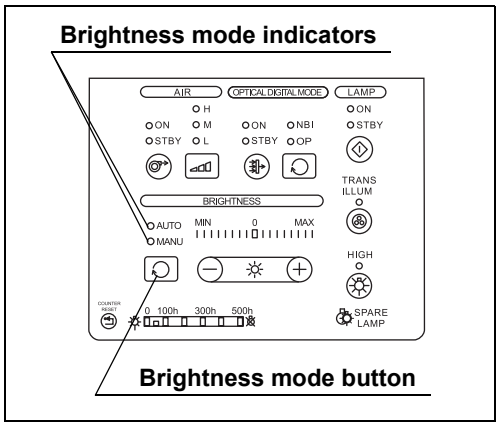


Figure 4.7

2 Press the brightness mode button on the control panel and confirm that each press switches the brightness mode indicators between “AUTO” and “MANU”. (See Figure 4.7)

4.9 Inspection of brightness adjustment

Confirm that the brightness of the examination lamp can be adjusted.
The inspection method differs according to the endoscope to be used. Select either the “AUTO” or “MANU” mode as shown in Table 4.1.

Brightness adjustment mode	Connected endoscopes
AUTO	EVIS EXERA III 190 series videoscope EVIS EXERA 160, EVIS EXERA II 180 series videoscope EVIS 100, EVIS 130, EVIS 140 series videoscope OES fiber endoscope used in combination with the video converter Rigid videoscope Flexible videoscope Rigid endoscope used in combination with a camera head and the light guide cable Fiber endoscope used in combination with a camera head and the light guide cable
MANU	OES fiber endoscope Rigid endoscope used in combination with the light guide cable Fiber endoscope used in combination with the light guide cable

Table 4.1

■ Inspection of automatic brightness adjustment

WARNING

When disconnecting the camera head or the video converter from the endoscope without turning the examination lamp OFF, make sure that the brightness mode indicator is set to “MANU” and that the light intensity adjustment button is set to the minimum examination light intensity. If the camera head or the video converter is disconnected while the brightness mode indicator is set to “AUTO”, the intense light may cause eye injury.

1 Confirm that the endoscope is connected to the light source and the video system center, and that both are turned ON.

CAUTION

If the video system center is not turned ON, the automatic brightness adjustment does not function, and the brightness may be insufficient.

2 Press the lamp button on the control panel: the examination lamp is ignited.

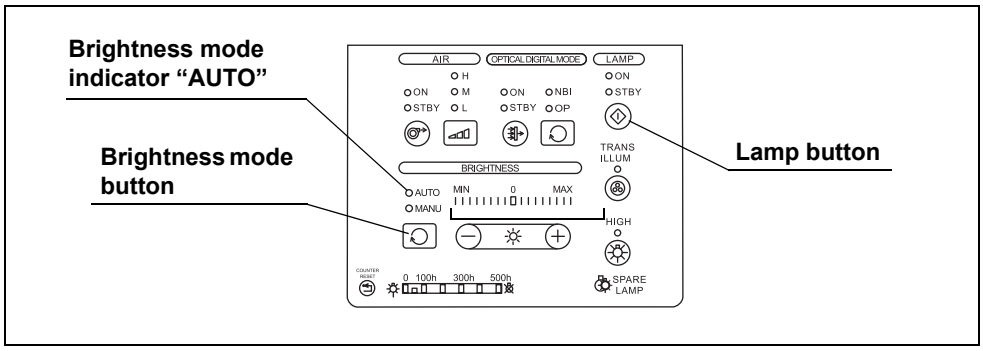


Figure 4.8

3 Press the brightness mode button and select “AUTO”.

4 Point the distal end of the endoscope at a suitable object and vary the distance between 5 and 60 mm. Confirm that the light being emitted from the distal end varies with the distance.

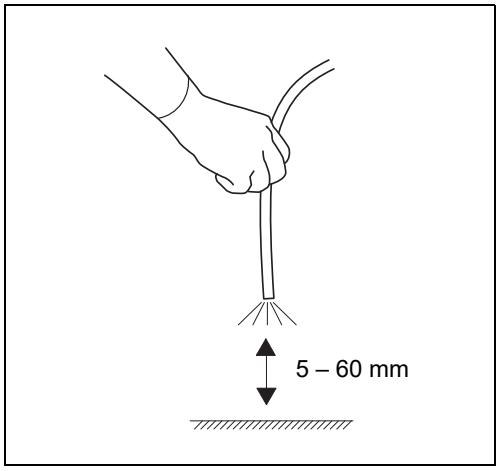


Figure 4.9

5 Hold the distal end of the endoscope at a distance between 30 and 40 mm to the object and press the brightness buttons (“–” or “+”). Confirm the following:

- Each time either of the brightness buttons is pressed, a beep is heard and the brightness increases or decreases accordingly. The brightness indicator also increases or decreases.
- When either of the brightness buttons is pressed continuously, successive beeps are heard and the brightness indicator increases or decreases continuously.
- The brightness of the light emitted from the distal end of the endoscope increases or decreases according to the brightness.

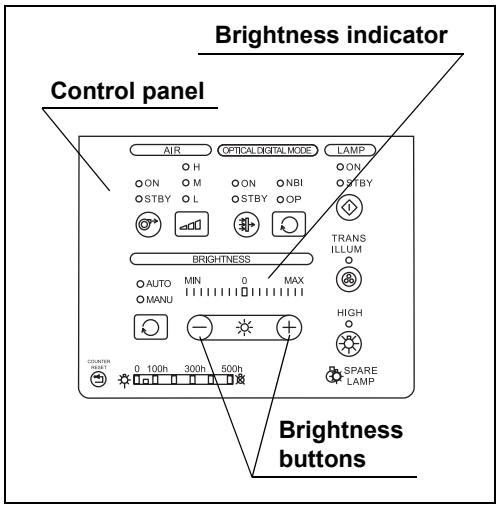


Figure 4.10

CAUTION

Confirm that a beep is heard when pressing the brightness button. When a beep is not heard, the light source may malfunction. Contact Olympus.

NOTE

The brightness indication is interlocked with the brightness indication of the connected video system center. When the brightness buttons on the video system center are pressed, the brightness indication on the light source varies in an interlocked operation.

■ *Inspection of manual brightness adjustment*

WARNING

When using the manual brightness adjustment, always set the brightness to the minimum level necessary to complete the examination. If the light is too bright, eye injury or burns can result.

1 Press the lamp button on the control panel: the examination lamp is ignited.

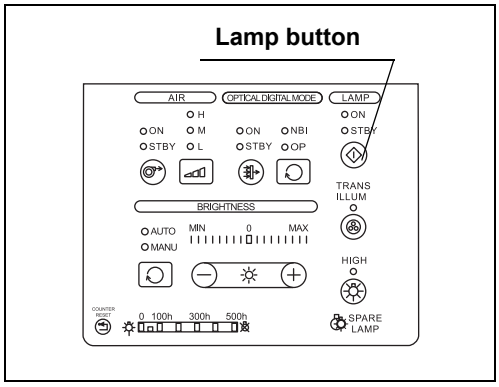


Figure 4.11

2 Press the brightness mode button and select “MANU”.

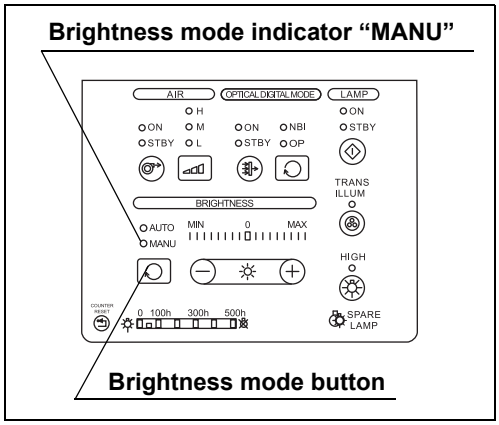


Figure 4.12

3 Press the brightness buttons (“–” or “+”) and confirm the following:

- Each time either of the brightness buttons is pressed, a beep is heard and the brightness increases or decreases accordingly. The brightness indicator also increases or decreases.
- When either of the brightness buttons is pressed continuously, successive beeps are heard and the brightness indicator increases or decreases continuously.
- The brightness of the light emitted from the distal end of the endoscope increases or decreases according to the brightness.

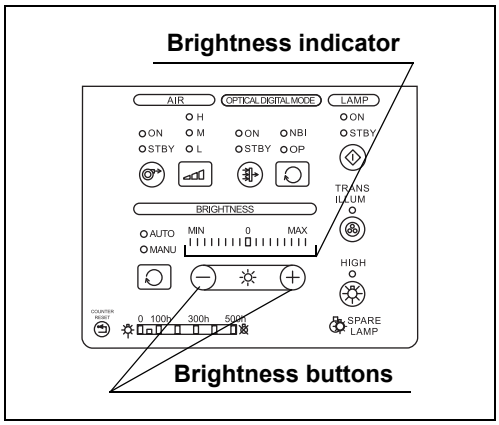


Figure 4.13

CAUTION

Confirm that a beep is heard when pressing the brightness button. When a beep is not heard, the light source may malfunction. Contact Olympus.

NOTE

The brightness indication is interlocked with the brightness level indication of the connected video system center. When the brightness buttons on the video system center are pressed, the brightness indication on the light source varies in an interlocked operation.

4.10 Inspection of the optical-digital observation function

Optical-digital observation is available when the light source is used in combination with the videoscope or camera head compatible with the optical-digital observation. Confirm that the optical-digital observation mode is selected.

1 Confirm that the available observation mode indicators show the available optical-digital observation modes.

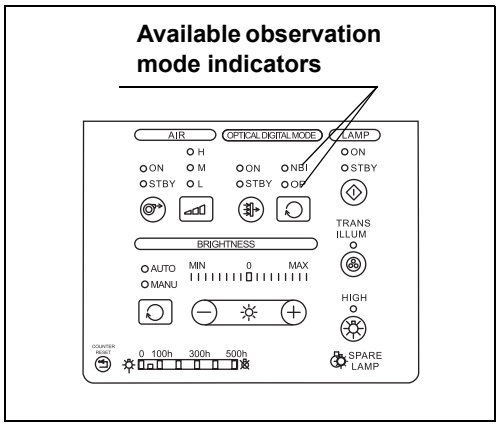


Figure 4.14

NOTE

The available observation modes vary depending on the connected endoscope.

2 Press the observation mode button on the front panel to light up the observation mode indicator “ON”. Confirm that the endoscopic image is displayed in the optical-digital observation mode indicated by the observation mode selection indicators.

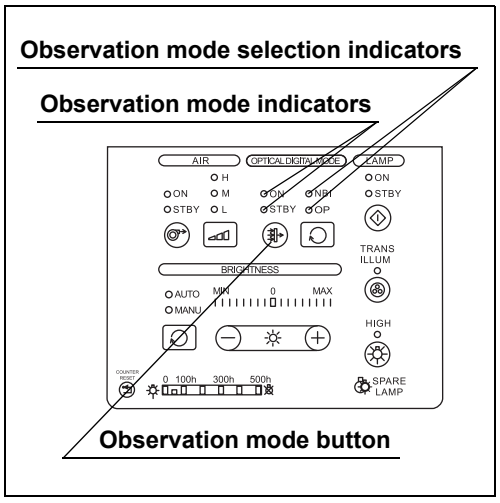


Figure 4.15

3 If more than one available observation mode indicator lights up, press the observation mode select button and confirm that each press switches the optical-digital observation mode being selected.

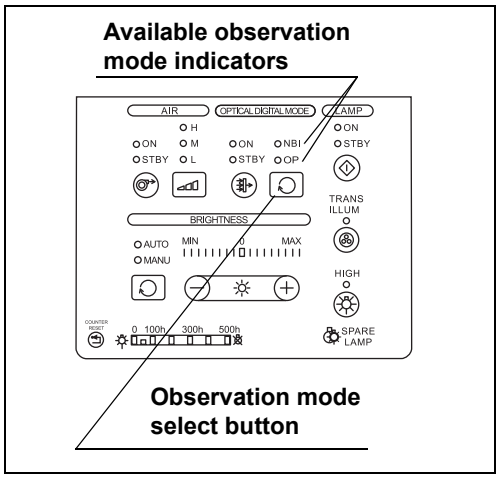


Figure 4.16

4 Press the observation mode button to light up the observation mode indicator “STBY”. The light source returns to the normal light observation mode.

NOTE

The settings for observation mode are not retained after the light source is turned OFF. The light source is always in the normal light observation mode at the moment it is turned ON.

4.11 Inspection of the transillumination function

Confirm that the distal end of the endoscope emits white light at the maximum intensity for about 7 seconds by pressing the transillumination button.

The following endoscopes are compatible with the transillumination function.

- EVIS series videoscope
- OES 10/20/30/40/60 series
- OES E/E3 series

WARNING

Do not use the transillumination function while looking into the eyepiece of the endoscope. The light intensity may cause eye injury.

NOTE

- The transillumination function is not available when no endoscope is connected to the light source or the examination lamp is not lighting up.
- The function is available only when a compatible fiber endoscope or videoscope is connected.
  The following endoscopes are compatible with the transillumination function:
  - EVIS series videoscope
  - OES 10/20/30/40/60 series
  - OES E/E3 series

1 Press the transillumination button on the control panel.

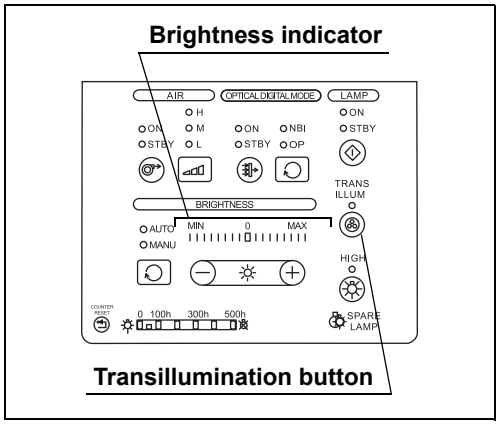


Figure 4.17

2 Confirm that the transillumination button blinks, and the brightness indicator indicates the maximum level (see Figure 4.17). The examination light changes to the maximum intensity for about 7 seconds.

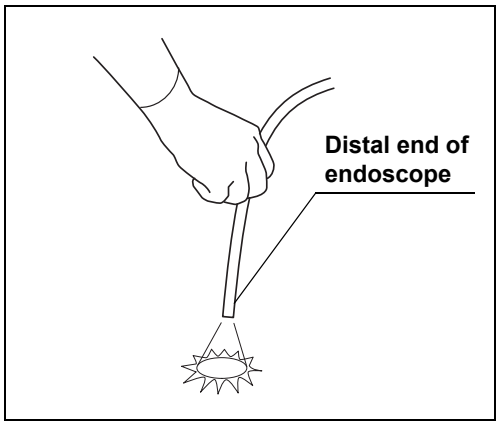


Figure 4.18

3 Confirm that the examination light changes to its original brightness after 7 seconds.

NOTE

Pressing any lit button except the lamp button and counter reset button on the control panel cancels the transillumination function.

4.12 Inspection of the high intensity mode

NOTE

- The high intensity mode is not available when no endoscope is connected to the light source.
- New products released after the introduction of the light source may also be compatible for use in combination with the light source. For further details, refer to the instruction manual for the endoscope or the light guide cable to be used or contact Olympus.

1 Press the brightness mode button on the control panel and confirm that the “MANU” indicator lights up.

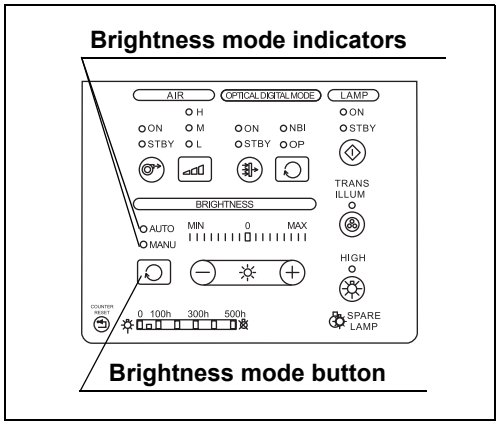


Figure 4.19

2 Press the brightness buttons on the control panel to set the brightness level to 0.

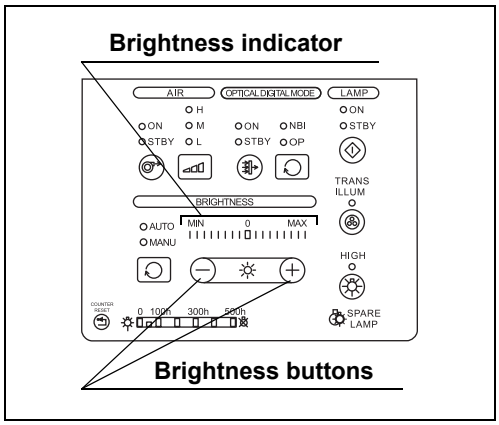


Figure 4.20

3 Press the intensity mode button on the control panel: the normal mode is changed to the high intensity mode.

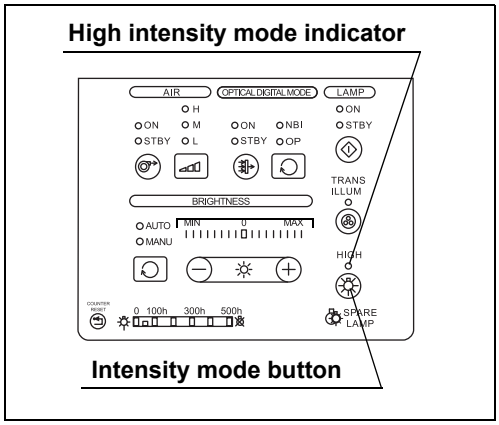


Figure 4.21

4 Confirm that the high intensity mode indicator lights up and that the light emitted from the endoscope’s distal end increases compared to the normal mode.

5 Press the intensity mode button to switch to the normal intensity mode. (See Figure 4.21)

6 Confirm that the high intensity mode indicator goes out and the light emitted from the endoscope's distal end decreases compared to the high intensity mode. (See Figure 4.21)

7 Press the intensity mode button again and confirm that the high intensity mode is restored.

8 Disconnect the endoscope from the output socket on the light source. Confirm that the high intensity mode indicator is still lighting up.

9 Turn the light source OFF and turn it ON again. Confirm that the high intensity mode indicator lights up.

10 Connect the endoscope that is compatible with the high intensity mode to the output socket on the light source again. Confirm that the high intensity mode indicator is still lighting up.

11 Press the brightness mode button and confirm that the "AUTO" indicator lights up. (See Figure 4.19)

NOTE

The intensity setting is automatically saved when the light source is turned OFF and is recalled when the light source is turned ON again.

12 Press and hold the lamp button for about 1 second. The examination lamp turns OFF, and lamp indicator "STBY" lights up.

4.13 Inspection of air and water feeding

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

NOTE

- The air and water feeding function is not available when no endoscope is connected to the light source.
- The air and water feeding function is available only when a compatible fiber endoscope or videoscope is connected.

1 Press the airflow button: the airflow indicator "ON" lights up.

2 Press the airflow regulator button repeatedly and confirm that the indication of the airflow regulator indicators light up in the cycle of "L" (low), "M" (medium), and "H" (high).

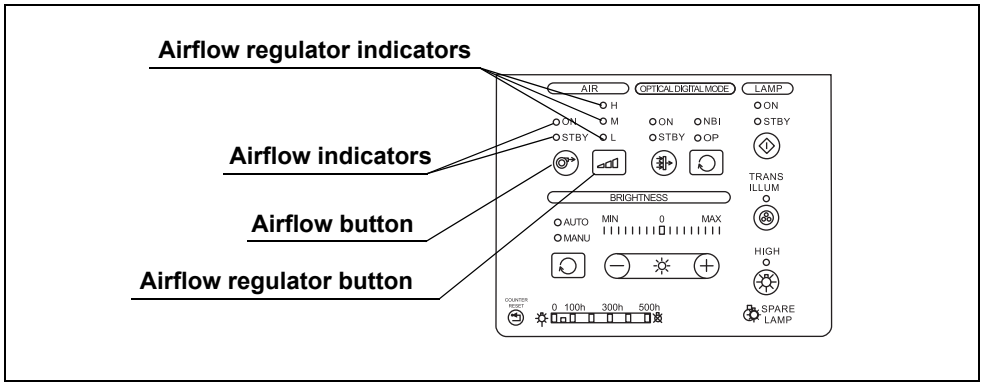


Figure 4.22

NOTE

- The airflow regulator setting is automatically saved when the light source is turned OFF, and it recalled when the light source is turned ON again.
- The factory default setting of the airflow level is "H" (high).

3 Press the airflow regulator button to set the airflow to High.

4 Immerse the distal end of the insertion section in sterile water to a depth of 10 cm.

5 Cover the hole of the air/water valve of the endoscope.

6 Press the airflow regulator button to change the airflow level setting and confirm that the amount of bubbles from the air/water nozzle changes accordingly.

7 Release the hole of the air/water valve of the endoscope.

8 Remove the distal end of the endoscope from the sterile water.

9 Depress the air/water valve of the endoscope.

10 Press the airflow regulator button to change the airflow level setting and confirm that the amount of water exiting from the air/water nozzle changes accordingly.

11 Release the air/water valve of the endoscope.

4.14 After inspection

If the light source will not be used immediately, press the power switch on the light source to turn it OFF (refer to Section 5.11, “Turning the light source OFF”).

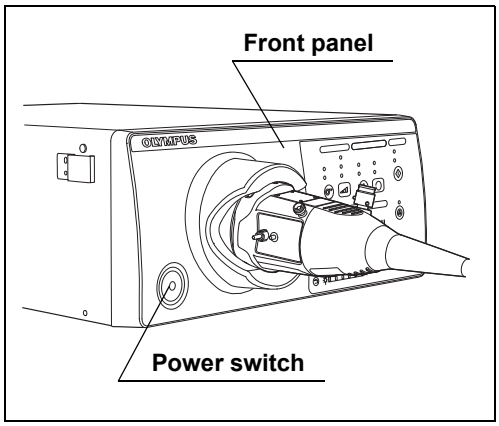


Figure 4.23

Chapter 5 Operation

The operator of the light source must be a physician or medical personnel under the supervision of a physician and must have received sufficient training in clinical endoscopic technique. This manual, therefore, does not explain or discuss clinical endoscopic procedures. It only describes basic operation and precautions related to the operation of the light source. Before using the light source, make sure to perform inspection of the light source as described in Chapter 4, “Inspection”.

5.1 Attention to operation

WARNING

- Be sure to wear protective equipment, such as eye wear, face mask, moisture-resistant clothing and chemical-resistant gloves that fit properly and are long enough so that your skin is not exposed. Dangerous chemicals and/or potentially infectious material, such as blood and/or mucus of the patient may cause an infection.
- Should any irregularity be observed, do not use the light source. Damage or irregularity may cause an electric shock.

WARNING

- Anytime you observe an irregularity in a light source function, stop the examination immediately and take action according to the following procedures. Using a defective light source may cause patient and/or operator injury. After withdrawing the endoscope from the patient, refer to the instructions in Chapter 8, “Troubleshooting”. If the problem cannot be resolved by the remedial action as described in Chapter 8, do not use the light source and immediately contact Olympus.
  - If the image on the monitor becomes completely white or black when the automatic brightness adjustment is active, the automatic brightness adjustment may have failed. In this case, set the brightness mode indicator to “MANU” and adjust the brightness manually. Withdraw the endoscope from the patient slowly as described in the endoscope’s instruction manual. After ensuring the safety of the patient, connect the endoscope to a spare light source.
  - If the examination lamp fails and the emergency lamp lights up, turn OFF the light source, and then light up the examination lamp again. If the emergency lamp still lights up, confirm the patient’s safety and then connect the endoscope to a spare light source. Note that the emergency lamp offers only the minimum brightness required in case of an emergency and it is dangerous to continue the use of the light source under the emergency lamp.
  - If any other irregularity occurs or is observed, confirm the patient’s safety and then connect the endoscope to a spare light source.
- Turn the light source OFF or extinguish the examination lamp by pushing the lamp button while not using the light source. Leaving the examination lamp ON will cause the distal end of the endoscope to become hot and could cause operator and/or patient burns.
- A current of warm air comes out of the ventilation grill on the rear panel of the light source. Operator and/or patient burns can result.
- Use only Olympus high-frequency electrosurgical equipment with this unit. Non-Olympus equipment can cause instability of the automatic brightness adjustment.
- Before using high-frequency electrosurgical equipment, make sure that the noise does not affect the observation and surgical procedures. If high-frequency electrosurgical equipment is used without such confirmation, patient injury may result.
- Do not connect/disconnect the digital light source cable (MAJ-1933) to/from the light source while it is ON. An electric shock can result.

WARNING

- When using spray-type medical agents, such as lubricant, anesthetic, or alcohol, use them away from the light source so that the medical agents do not contact the light source. Medical agents might enter the light source through the ventilation grills and may cause equipment damage.
- Do not use a humidifier near the light source as condensation might occur, and it may cause an equipment failure.
- If the endoscopic image seems to be dark in an optical-digital observation mode, change to the normal observation mode. Otherwise, the examination might not be performed safely.

NOTE

Set the brightness of the examination light to the minimum necessary to perform the procedure safely. If the endoscope is used for a prolonged period at or near maximum light intensity, vapor like smoke may be observed in the endoscopic image. This is caused by the evaporation of organic material (remaining blood, moisture of stool etc.) due to heat generated by the light guide near the light guide lens. If this vapor continues to interfere with the examination, remove the endoscope, wipe the distal end of the endoscope with a lint-free cloth moistened with 70% ethyl or isopropyl alcohol, reinsert the endoscope, and continue the examination.

5.2 Operation workflow

Please see the operation workflow below. Follow each step of the workflow for using the light source.

1 **Inspect the light source and the ancillary equipment.**
→Chapter 4 on page 41

2 **Turn the light source ON and ignite the examination lamp.**
→Section 5.3 on page 69

3 **Set the brightness mode.**
→Section 5.4 on page 70

4 **Adjust the brightness of the examination lamp.**
→Section 5.5 on page 71

5 **Operate the light source.**
- Optical-digital observation→Section 5.6 on page 74
- Transillumination→Section 5.7 on page 76
- High intensity mode→Section 5.8 on page 77
- Air and water feeding→Section 5.9 on page 78

6 **After examination, extinguish the examination lamp or turn the light source OFF.**
- Extinguish the examination lamp→Section 5.10 on page 79
- Turn the light source OFF→Section 5.11 on page 80

7 **Disconnect the endoscope.**

8 **Care for and store the light source and accessory as appropriate after use.**
→Section 7.1 on page 93

5.3 Turning the light source ON and igniting the examination lamp

WARNING

When turning ON the light source, never allow the distal end of an endoscope or a light guide cable to come in contact with the patient and/or other flammable materials, such as operating room drapes. Patient injury and/or a fire can result.

1. Confirm that the endoscope connector, light guide connector, or light guide is connected to the output socket of the light source.
2. Press the power switch of the light source. If the automatic ignition is selected, the light source is turned ON and the power indicator lights up. Also, the examination lamp lights up. If the manual ignition is selected, the light source is turned ON and the power indicator lights up. Also, pressing the lamp button on the control panel turns ON the examination lamp and the lamp indicator “ON” lights up.

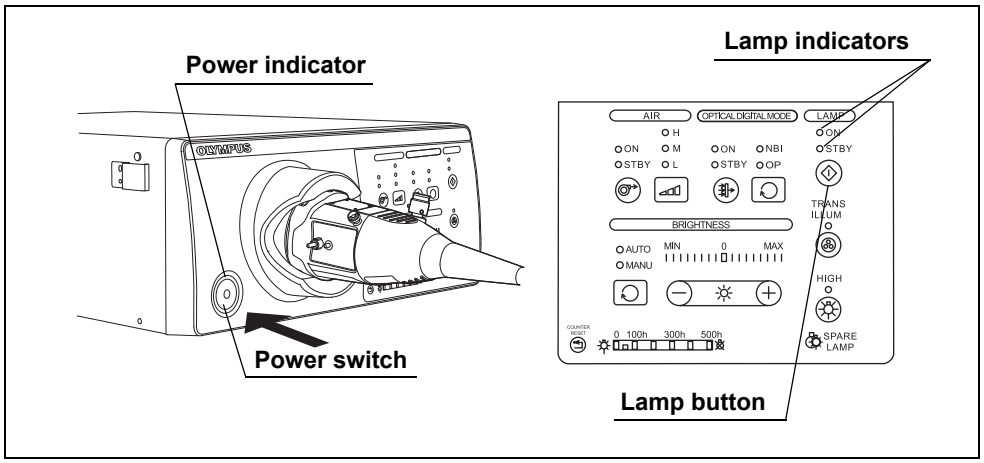


Figure 5.1

NOTE

- The factory default setting is manual ignition.
- When the light source is connected to the light source, either of them can be turned ON first.

5.4 Setting the brightness mode

Set the brightness mode of the light source according to the endoscope to be used. The brightness mode determines the examination light supplied to the endoscope and the method of adjusting its intensity.

1. Confirm the brightness adjustment mode of the endoscope to be used according to the Table 5.1.
2. Press the brightness mode button to select the brightness mode. The selected brightness mode is indicated by the brightness mode indicators.

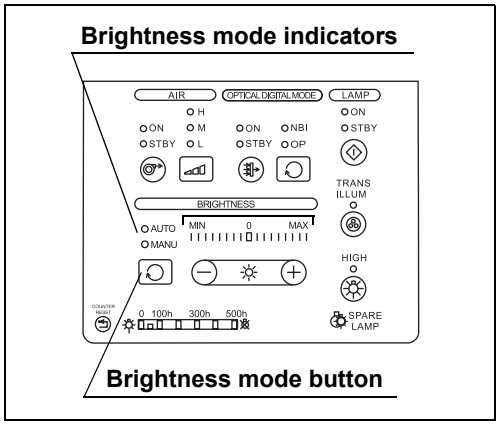


Figure 5.2

Ch.5

Brightness mode	Connected endoscopes
AUTO	EVIS EXERA III 190 series videoscope EVIS EXERA 160, EVIS EXERA II 180 series videoscope EVIS 100, EVIS 130, EVIS 140 series videoscope OES fiber endoscope used in combination with the video converter Rigid videoscope Flexible videoscope Rigid endoscope used in combination with a camera head (the light guide cable) Fiber endoscope used in combination with a camera head (the light guide cable)
MANU	OES fiber endoscope Rigid endoscope used in combination with the light guide cable (no camera head) Fiber endoscope used in combination with the light guide cable (no camera head)

Table 5.1

WARNING

When using a fiber endoscope or a rigid endoscope without a camera head or video converter, set the brightness mode indicator to “MANU”. Setting to “AUTO” does not enable the automatic brightness adjustment, and the brightness may not be adequate.

5.5 Brightness adjustment

Adjust the brightness of the examination lamp. The adjustment method varies depending on the brightness adjustment mode set in Section 5.4, “Setting the brightness mode”.

■ Automatic brightness adjustment

WARNING

When disconnecting the camera head or the video converter from the endoscope without turning the lamp OFF, set the brightness mode indicator to “MANU” and set the brightness indicator to the minimum level. If the camera head or the video converter is disconnected while the brightness mode is set to “AUTO”, the intense light may injure your eyes.

CAUTION

Turn the video system center ON to enable the automatic brightness adjustment function of the light source. If the video system center is not turned ON, the automatic brightness adjustment does not function, and the brightness may not be adequate.

Press either of the brightness buttons (“–” or “+”) to set the brightness to a level suitable for observation: the set brightness is shown by the brightness indicator.

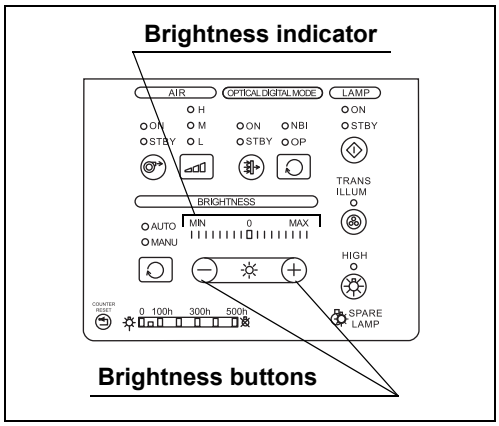


Figure 5.3

NOTE

- The standard brightness setting is “0”.
- The standard brightness may be too bright or too dark depending on the endoscope type and observation region. In this case, adjust the brightness as required.
- Pressing either of the brightness buttons (“–” or “+”) once increases or decreases the brightness by one step; pressing the button continuously increases or decreases the brightness continuously.
- The brightness level value is saved per observation mode. The brightness should be adjusted for each observation mode (i.e. separately for NBI).
- The brightness indication is interlocked with the brightness indication of the connected video system center. When the brightness buttons on the video system center are pressed, the brightness indication on the light source varies in an interlocked operation.

■ *Manual brightness adjustment*

WARNING

Always adjust the examination light to the minimum required brightness for observation, and do not bring the examination light in the proximity of a mucous membrane for an extended period. Use of higher brightness than required may cause eye injury or burns to the patient.

Press either of the brightness buttons (“–” or “+”) to set the brightness to a suitable level for observation: the set brightness is shown by the brightness indicators.

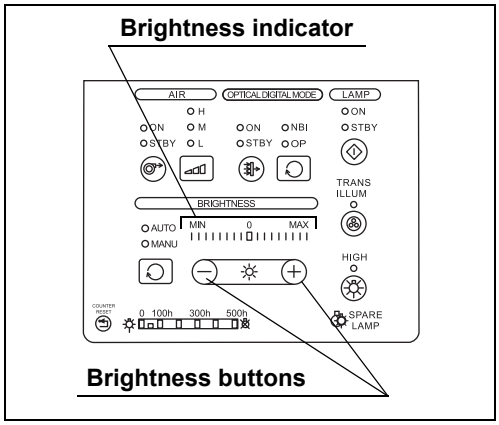


Figure 5.4

NOTE

- Pressing either of the brightness buttons (“–” or “+”) once increases or decreases the brightness by one step; pressing the button continuously increases or decreases the brightness continuously.
- The brightness indication is interlocked with the brightness indication of the connected video system center. When the brightness buttons on the video system center are pressed, the brightness indication on the light source varies in an interlocked operation.

5.6 Optical-digital observation

Optical-digital observation is available when the light source is used in combination with the video system center (CV-190) and a videoscope.

WARNING

- Do not rely on the optical-digital observation alone for primary detection of lesions or for a decision regarding any potential diagnostic or therapeutic intervention.
- If the endoscopic image seems to be dark in the NBI observation, change to the normal observation. Otherwise, an improper image may be obtained.

1 Check the available observation mode indicators to confirm the available observation modes.

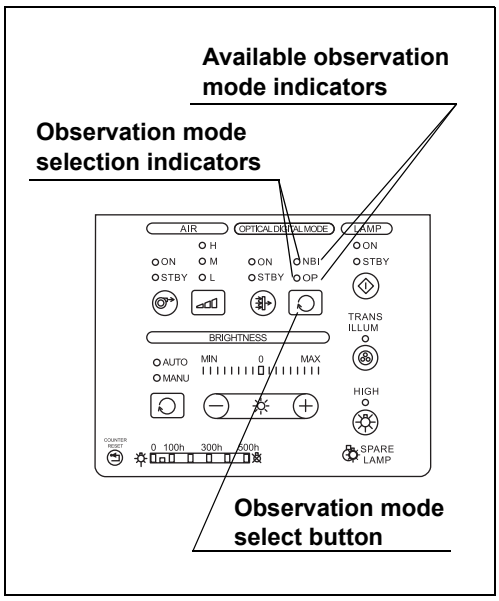


Figure 5.5

NOTE

The available optical-digital observation modes vary depending on the connected endoscope.

2 If more than one of the available observation mode indicators is lighting up, press the observation mode select button and select the desired optical-digital observation mode. The observation mode selection indicators of the selected mode lights up.

3 Press the observation mode button: the observation mode indicator “ON” lights up, and the observation mode changes to the optical-digital observation indicated by the observation mode selection indicator.

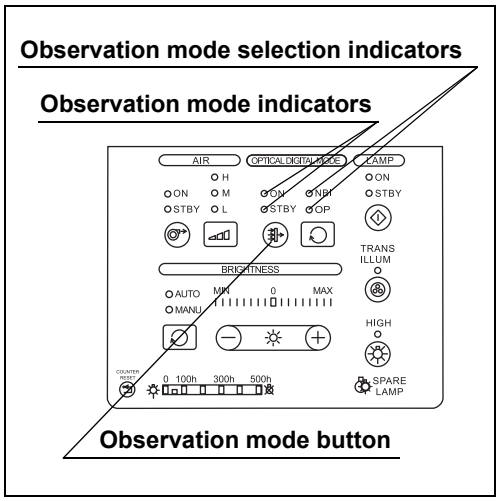


Figure 5.6

4 Press the observation mode button again: the observation mode indicator “STBY” lights up, and the observation mode changes to the normal observation mode.

NOTE

- The settings for the selected observation mode are not retained after the light source is turned OFF. The light source is always in the normal light observation mode at the moment it is turned ON.
- When more than one of the available observation mode indicators are lighting up, the observation mode can be changed by pressing the observation mode button even if the observation mode indicator “ON” is lighting up.
- Optical-digital observation can also be activated via the endoscope switches when this function has been activated in the video system center.
- The available observation modes are interlocked with the video system center.

5.7 Transillumination function

The examination light emitting from the distal end of the endoscope is set to the maximum intensity for about 7 seconds, which may enable the operator to confirm the position of the distal end from outside the patient's body.

WARNING

- Do not use the transillumination function unless absolutely necessary. Eye injury or burns can result.
- Do not use the transillumination function while looking into the eyepiece of the endoscope. Eye injury can result.

Press the transillumination button: the transillumination indicator blinks, the examination light is set automatically to the maximum intensity for about 7 seconds and the brightness indicator indicates the maximum level.
After about 7 seconds, the transillumination indicator is extinguished, and the examination light returns to original intensity.

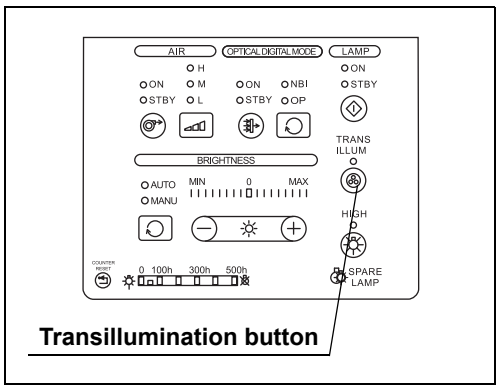


Figure 5.7

NOTE

- It may be impossible to locate the endoscope's distal end in certain observation regions even with transillumination function.
- To stop the transillumination function in the middle of an examination, press any button except the lamp button and counter reset button.
- The transillumination function cannot be used when no endoscope is connected to the light source or the examination lamp does not light up.
- The function is available only when a compatible fiber endoscope or videoscope is connected.
  Refer to Section 4.11, "Inspection of the transillumination function" for the compatible endoscopes.

5.8 High intensity mode

CAUTION

When switching the normal intensity mode to high intensity mode, be sure to set the brightness at or below 0. Otherwise, the brightness will exceed the necessary level. It may result in operator and/or patient injury.

NOTE

The high intensity mode is not available when no endoscope is connected to the light source. The function is available only when a compatible endoscope is connected.
Refer to Section 4.12, “Inspection of the high intensity mode” for the compatible endoscopes.

1 Press the intensity mode button: the high intensity mode indicator lights up, and the intensity of the examination light increases automatically.

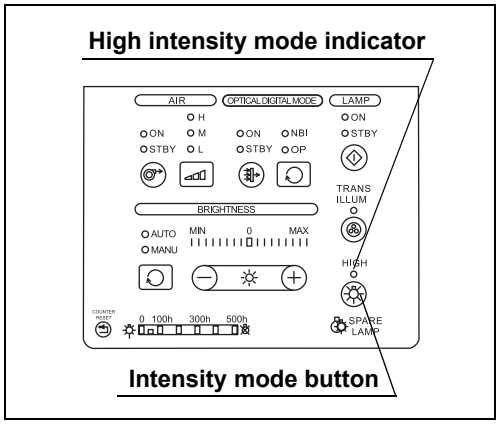


Figure 5.8

2 To activate the normal mode, press the high intensity mode button again. (See Figure 5.8)

5.9 Air/water feeding

WARNING

Over-insufflating the lumen may cause patient pain, injury, bleeding, gas embolism, and/or perforation.

1 Confirm that the airflow indicator “ON” lights up. If not, press the airflow button. The airflow indicator “ON” lights up to indicate that air is being fed to the endoscope.

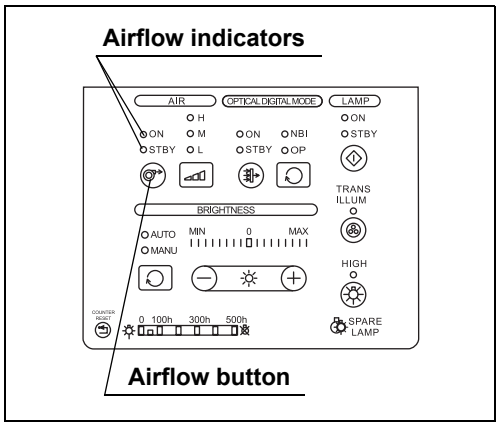


Figure 5.9

Ch.5

2 Press the airflow regulator button to set the airflow regulator according to the examination technique and/or patient condition. Each press of the button changes the airflow regulator indicators between L (Low), M (Medium), and H (High).

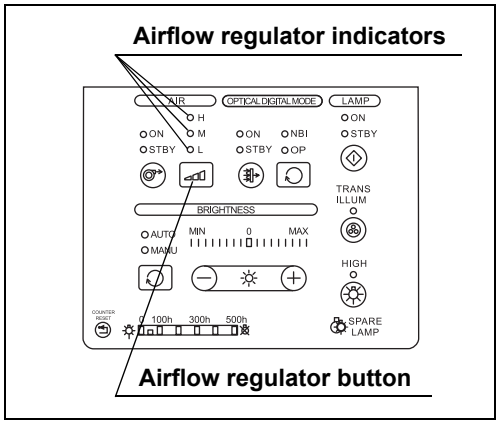


Figure 5.10

3 Feed water or air as described in the endoscope’s instruction manual.

NOTE

- The standard setting of the airflow regulator indicator is “H” (High).
- Air and water is not fed even if the airflow indicator “ON” is lighting when no endoscope is connected to the light source.
- The function is available only when a compatible fiber endoscope or videoscope is connected.
- The airflow regulator setting is retained even after the light source is turned OFF. The last airflow regulator setting is recalled the next time when the light source is turned ON.

5.10 Extinguishing the examination lamp

Press and hold the lamp button for about 1 second: the examination lamp is turned OFF, and the lamp indicator “STBY” lights up.

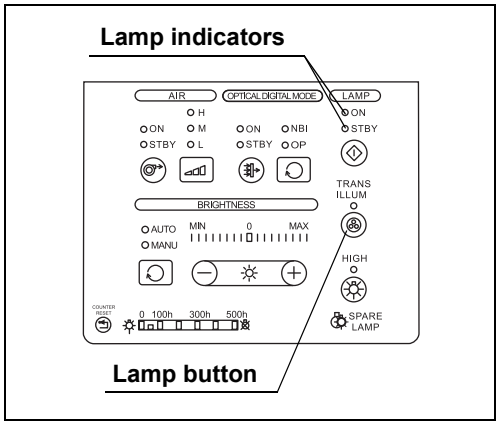


Figure 5.11

5.11 Turning the light source OFF

WARNING

- Do not touch the distal end of the scope connector of the endoscope, distal end of the light guide connector of the endoscope, the distal end of the light guide cable, distal end of the light guide cable's connector, or the output socket of the light source immediately after disconnecting it from the light source because they are extremely hot. Operator or patient injury can result.
- Since the light source irradiates strong examination light, the disconnected end of the light guide cable and the distal end of the endoscope can become very hot. To prevent a fire hazard, do not bring the disconnected end of the light guide cable or distal end of the endoscope in contact with a flammable object, such as operating room drapes during lighting of the examination lamp. When no examination is performed, be sure to turn the light source OFF or extinguish the examination lamp.

1 Press the power switch: the light source is turned OFF, and the power indicator is not lit.

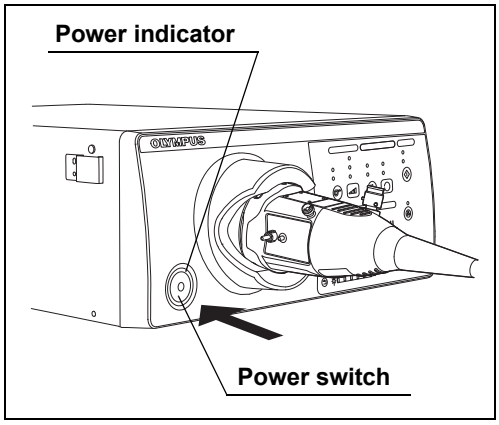


Figure 5.12

WARNING

When the power indicator is still lit after turning OFF the power, stop using the light source and disconnect the power cord. Then please contact Olympus.

2 Disconnect the endoscope as described in the endoscope's instruction manual.

3 If the light source is not to be used for an extended period of time, disconnect the power cord from the hospital-grade wall main outlet.

Chapter 6 Lamp Replacement

6.1 Replacement of the examination (xenon) lamp

Always use the examination lamp designated below. To order a new examination lamp, contact Olympus.

- Xenon lamp MAJ-1817

WARNING

- Never install a lamp that has not been approved by Olympus. The use of a nonapproved lamp can cause damage to the light source and ancillary equipment, malfunction or a fire.
- Turn the light source OFF and disconnect the power cord from the wall mains outlet before replacing the lamp with a new one. Otherwise, an electric shock may result.
- Do not touch anything inside the lamp chamber. The lamp chamber is extremely hot immediately after the lamp is turned OFF. Operator and/or patient burns can result.
- When replacing the lamp, do not leave any objects (such as a cloth and plastic bag) inside the lamp chamber. A fire and/or equipment damage can result.
- Store the hexagon wrench securely on the rear side of the lamp cover. If the wrench drops or any objects get inside the light source, turn OFF the light source immediately, disconnect the power cord and contact Olympus. If the light source is used while the wrench is left inside the light source, equipment damage and/or an electric shock can result.
- Dispose of the examination lamp as described in Section 7.7, “Disposal”. The glass surface may crack due to the high pressure inside the lamp if disposed of improperly.

CAUTION

- Do not touch the glass surface (filter) inside of the lamp chamber. Natural skin moisture from your fingers can cause cracks and damage the light source.
- Do not touch the glass surface of the lamp or reflector. Natural skin moisture from your fingers can cause cracks and damage the light source. If the glass surface of the lamp gets dirty, wipe it off with a lint-free cloth.

CAUTION

- Handle the lamp carefully. Do not apply excessive force or scratch the examination lamp. The glass surface may crack, the lamp life may shorten, or the light source may be damaged due to the high pressure inside the lamp.
- When replacing the examination lamp, use a clean, lint-free cloth to wipe off residual heat compound from the heat sink. If the heat compound is not wiped off completely, the lamp's heat efficiency will be impaired and the examination lamp life will be shortened significantly.
- Be sure to reset the lamp usage indicator as described in Section 6.4, "Lamp usage indicator reset" after replacing.
  Otherwise, the incorrect total working hours of the examination lamp will be indicated.

6.2 Removal of the lamp

1. When the examination lamp is ON, press and hold the lamp button for about 1 second to extinguish it.
2. Wait for a few minutes to allow the light source to cool the lamp chamber sufficiently.

NOTE

While the light source is ON and the examination lamp is extinguished, a fan built into the light source cools the lamp chamber.

3. Turn the light source OFF.
4. Disconnect the power cord from the hospital-grade wall mains outlet.

5 Turn the knobs of the lamp cover and remove the lamp cover.

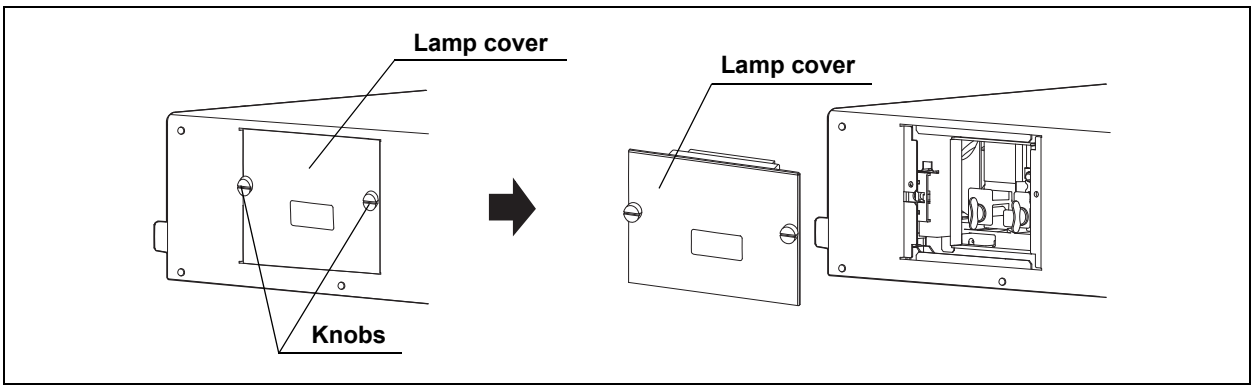


Figure 6.1

6 Confirm that the inside of the lamp chamber is not too hot. If the lamp chamber is extremely hot, attach the lamp cover, connect the power cord, turn the light source ON, and then repeat Step 1 through 6 above.

7 Remove the hexagon wrench from the rear of the lamp cover.

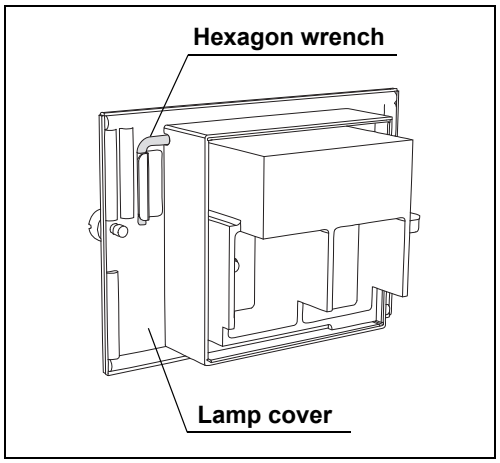


Figure 6.2

8 Turn knob (A) counterclockwise by 90° to loosen it.

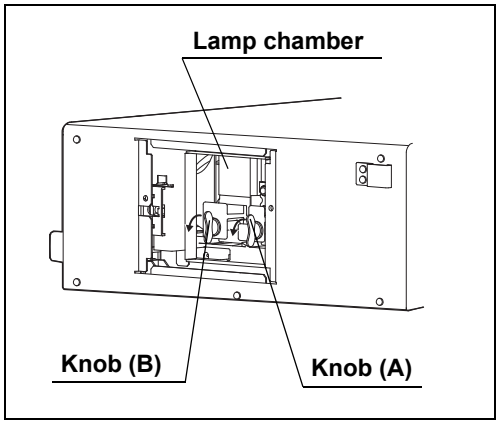


Figure 6.3

9 Turn knob (B) counterclockwise by 90° to loosen it. (See Figure 6.3)

10 Holding the knobs or projections of the heat sinks, remove the examination lamp with heat sinks (A) and (B) attached.

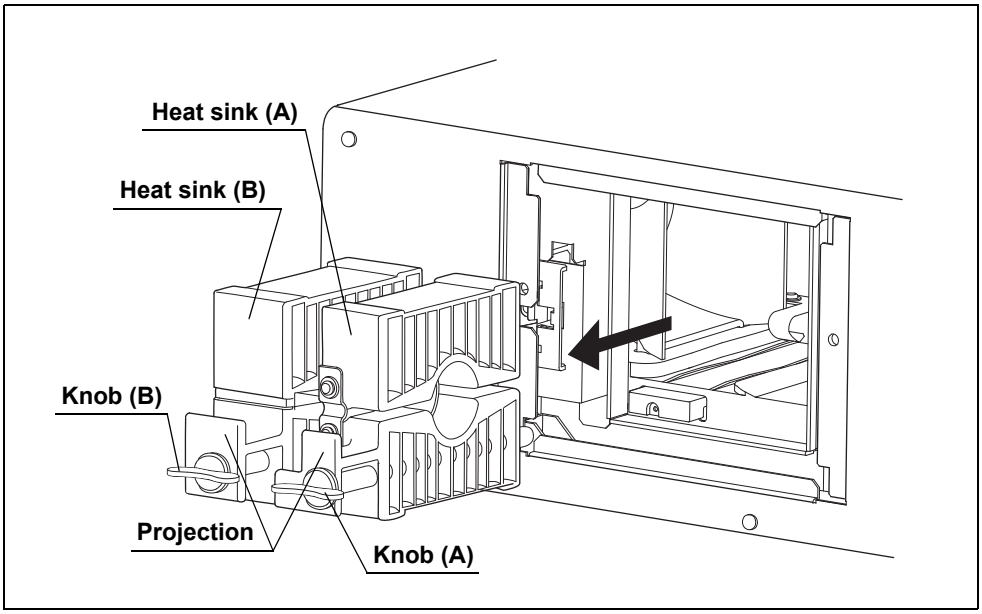


Figure 6.4

11 Using the hexagon wrench, loosen the three bolts on heat sink (B) (on the "+" side of the examination lamp) and remove heat sink (B) from the examination lamp.

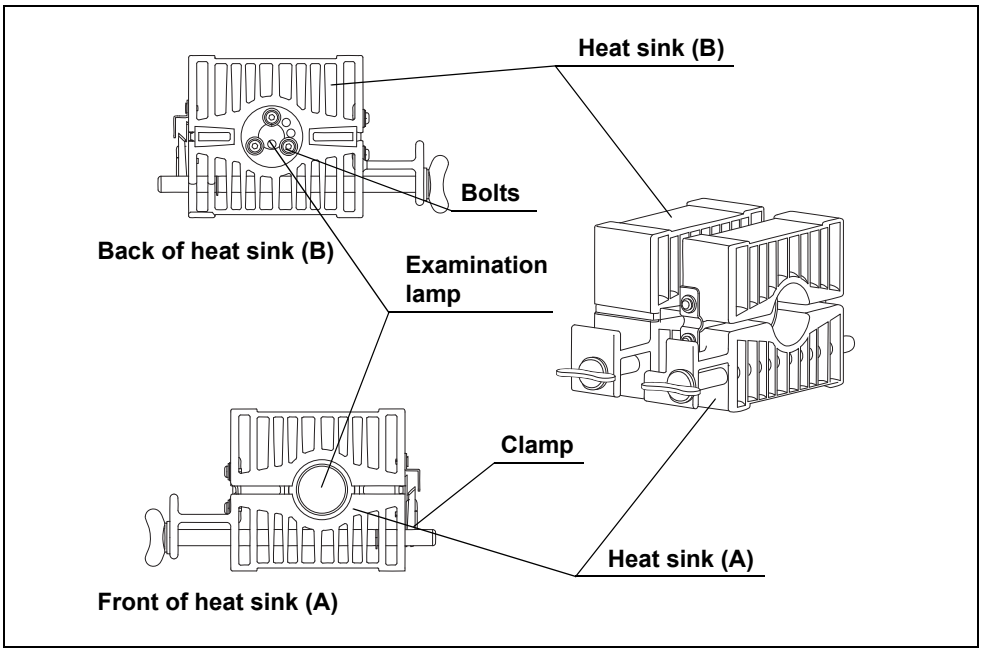


Figure 6.5

CAUTION

Washers are attached to bolts. Retain all three of them carefully because they will be used again to clamp the new examination lamp.

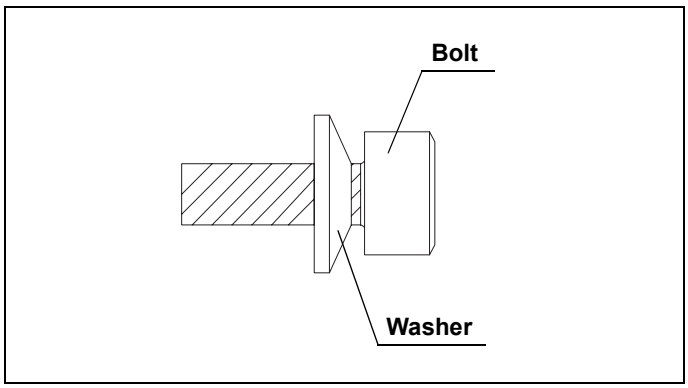


Figure 6.6

12 Remove the clamp of heat sink (A) and pull out the examination lamp. (See Figure 6.5)

13 Using a clean, lint-free cloth, wipe off any residual heat compound from the heat sink.

CAUTION

When replacing the examination lamp, use a clean, lint-free cloth to wipe off residual heat compound from the heat sink. If the heat compound is not wiped off completely, the lamp's heat efficiency will be impaired and the examination lamp life will be shortened significantly.

6.3 Insertion of the lamp

CAUTION

- Do not apply the heat compound to the glass surface and the ceramic part of the examination lamp. If any compound gets on the glass surface, wipe it off with a clean, lint-free cloth. Otherwise, the examination lamp may be damaged, and it may cause malfunction of the light source.
- Apply enough heat compound. If not enough heat compound is applied, the heat can cause lamp ignition failures.

1 Hold the new examination lamp without touching the glass surface.

2 Using your finger, apply the heat compound, provided with the new examination lamp thickly and evenly on the “+” side electrode of the examination lamp (see the shaded sections in Figure 6.7).

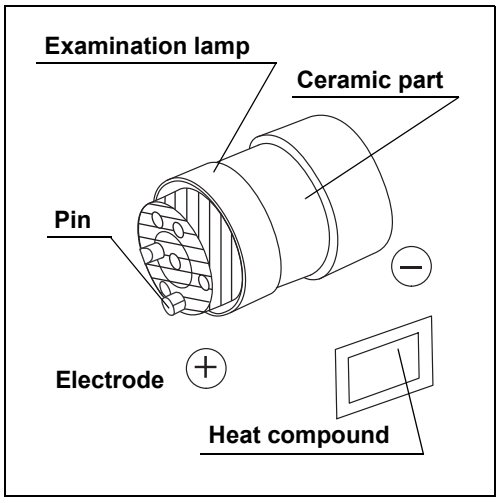


Figure 6.7

3 Insert the “+” side electrode of the examination lamp (see Figure 6.7) into heat sink (B) and tighten the three bolts firmly with the hexagon wrench.

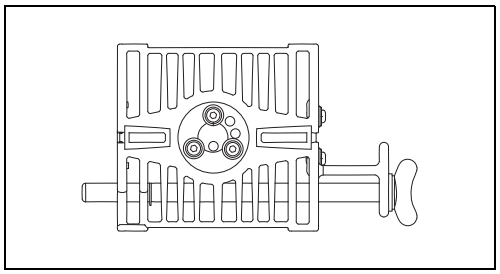


Figure 6.8

CAUTION

- When inserting the examination lamp into the heat sink, align their pin positions and tighten the bolts firmly. If the bolts are not tightened firmly, poor heat radiation may result in equipment damage, examination lamp ignition failure, and a considerable drop in the life of the examination lamp.
- Confirm the direction of the washers when tightening the bolts. If a washer is positioned incorrectly, the lamp may fail to light properly.

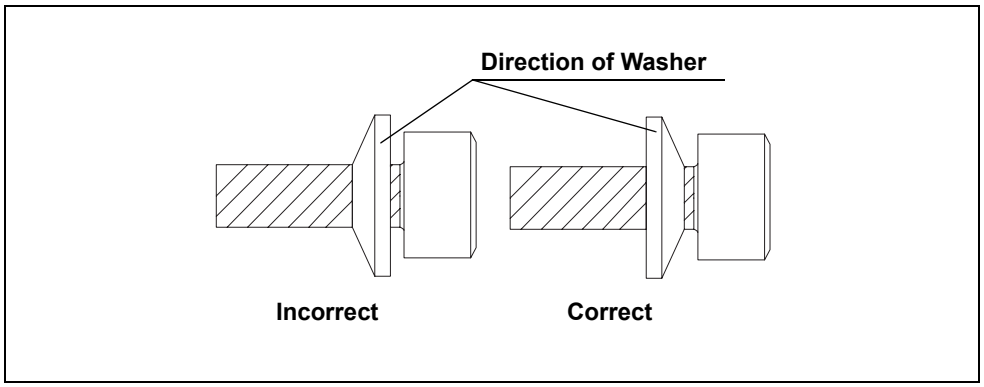


Figure 6.9

4 Using your finger, apply the heat compound thickly and evenly on the outer periphery of the "–" side electrode of the examination lamp (see the shaded section in Figure 6.10).

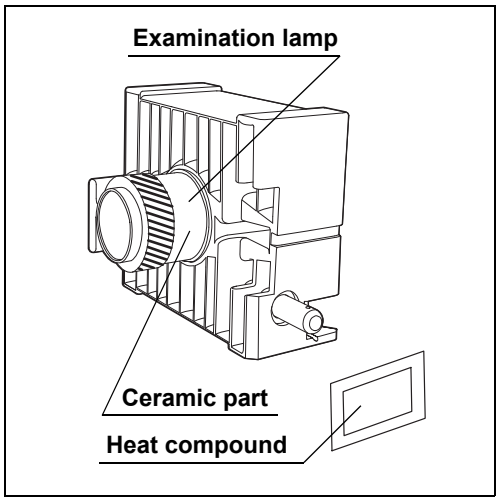


Figure 6.10

5 Insert the "–" side electrode of the examination lamp (see Figure 6.7) into heat sink (A) until it stops.

6 Place heat sink (A) and heat sink (B) so that their undersides are flat and close the heat sink clamp firmly.

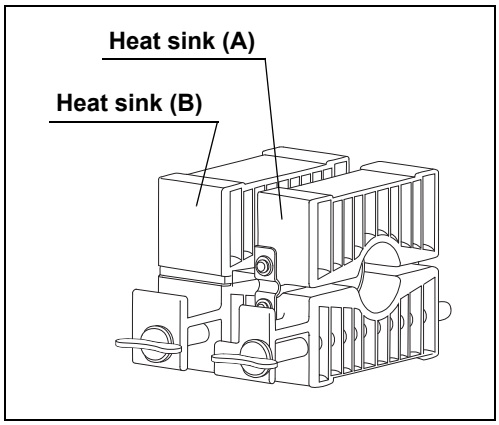


Figure 6.11

CAUTION

Be sure to tighten the heat sink clamp firmly. Poor heat radiation may result in equipment damage, examination lamp ignition failure, and a considerable decrease in the life of the examination lamp.

7 Insert both heat sinks (A) and (B) simultaneously into the lamp chamber along the insertion grooves.

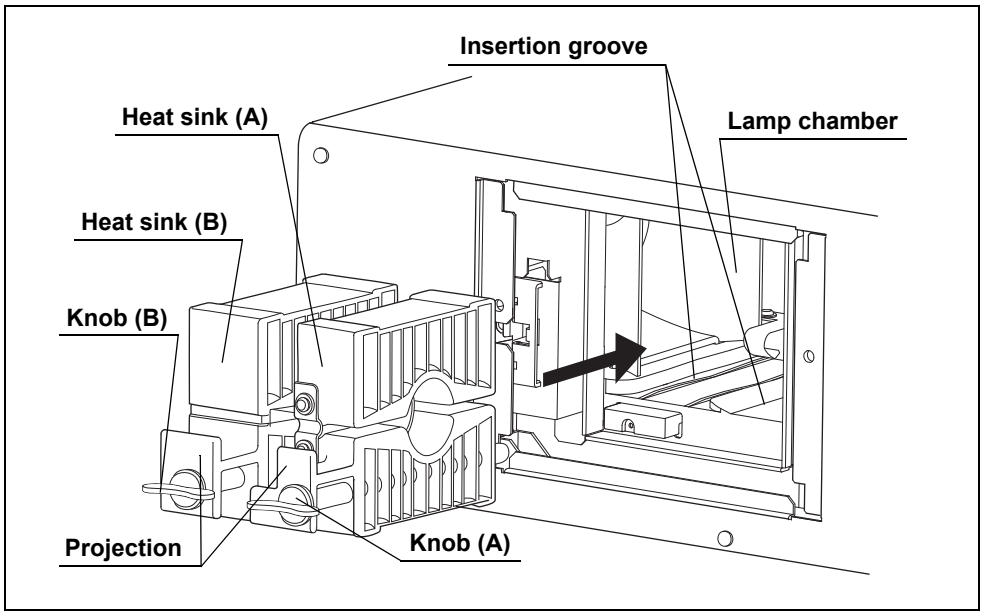


Figure 6.12

8 Turn the knob (B) clockwise by 90° from the horizontal position until it stops while pushing the knob.

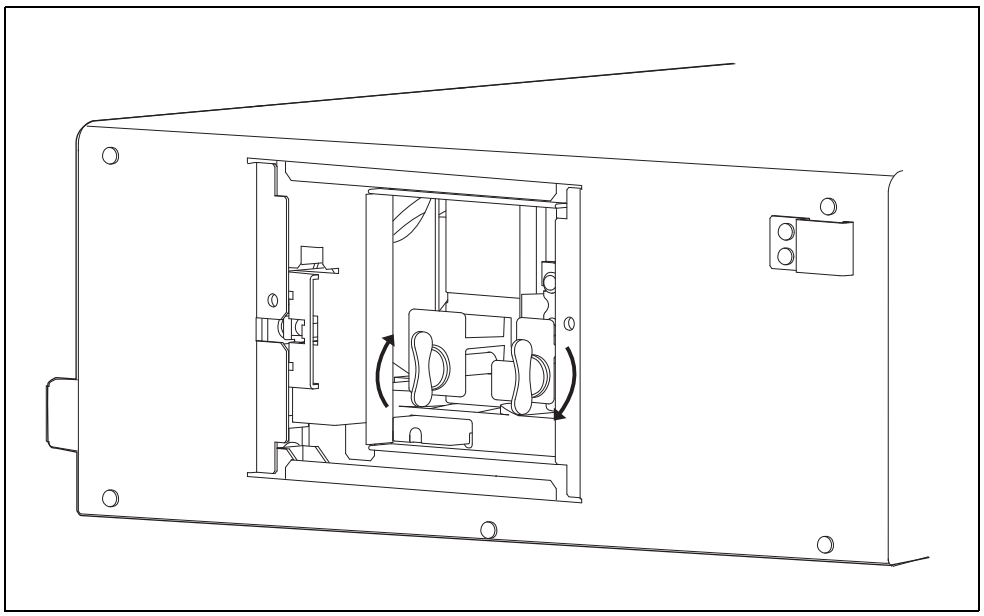


Figure 6.13

9 Turn the knob (A) clockwise by 90° from the horizontal position until it stops while pushing the knob. (See Figure 6.13)

10 Confirm that the heat sinks are attached firmly by pulling the projection. (See Figure 6.12)

CAUTION

If the heat sinks are not installed properly, their overheating may result in equipment damage or drop in the examination light brightness.

11 Store the hexagon wrench back on the rear of the lamp cover.

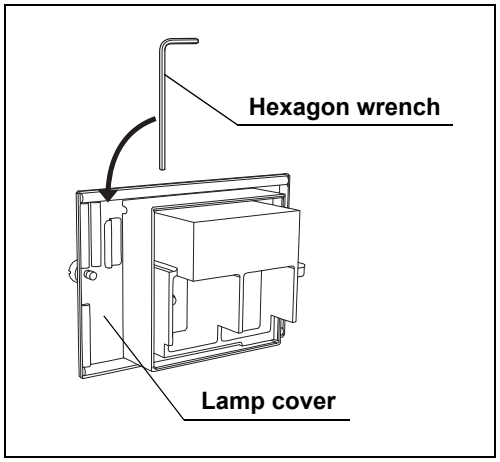


Figure 6.14

12 Turn the knobs of the lamp cover and close the lamp cover securely.

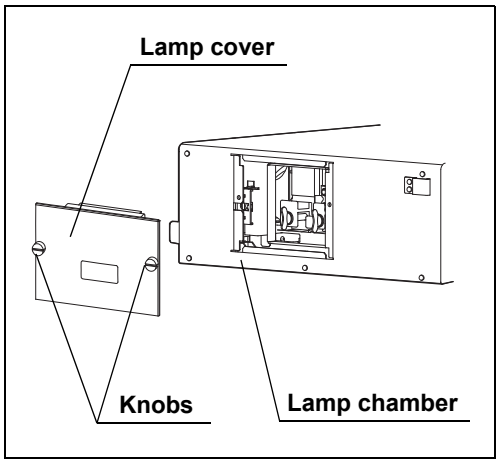


Figure 6.15

NOTE

For safety, the light source is designed so that it cannot be turned ON if the lamp cover is not attached securely.

13 Proceed with Section 6.4, “Lamp usage indicator reset” below.

6.4 Lamp usage indicator reset

When the examination lamp is replaced with a new one, reset the lamp usage indicator as described in this section.

CAUTION

Do not reset the lamp usage indicator when the examination lamp is not exchanged. Incorrect operating hours of the examination lamp will be indicated.

1. Connect the power cord and press the power switch: the light source is turned ON.
2. If the examination lamp lights up because automatic ignition was selected, press the lamp button on the control panel for 1 second: the examination lamp is turned OFF, and the lamp indicator “STBY” lights up.
3. Press and hold the counter reset button on the control panel for more than 3 seconds: the lamp usage indicator is reset. Confirm that the lamp usage indicator shows “0”.

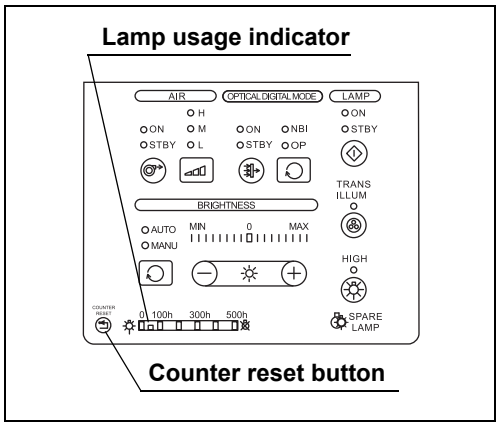


Figure 6.16

NOTE

The counter reset button is inactive if the examination lamp is lighting. To reset the lamp usage indicator, press the button while the examination lamp is in standby.

4. Turn the light source OFF immediately.
5. Inspect the light source as described in Chapter 4, “Inspection” before use.

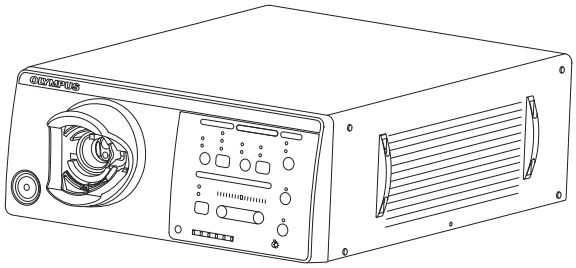
Chapter 7 Reprocessing, Storage, Disposal, and Transportation

7.1 Reprocessing

This section describes the method of reprocessing for the light source and accessories below.

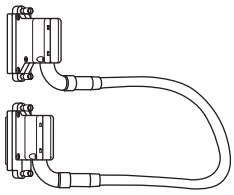
This section is based on the requirements of ISO 17664.

❍ Light source

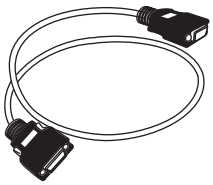


EVIS EXERA III xenon light source (CLV-190)

❍ Accessories



Digital light source cable (MAJ-1933)



Light source cable (MAJ-1941)

NOTE

Reprocess the water container (MAJ-901) as described in the instruction manual for the water container.

WARNING

- If patient debris directly or indirectly adheres to this instrument, disinfection has to be performed within 1 hour after the patient procedure. Patient debris will begin to dry and solidify, hindering effective removal and reprocessing efficacy.
- After wiping with a piece of moistened lint-free cloth, dry the light source and accessories thoroughly before using it again. If it is used while still wet, there is the risk of an electric shock.
- When caring the light source and/or accessories, always wear appropriate personal protection equipment such as eye wear, face mask, moisture-resistant clothing, and chemical-resistant gloves that fit properly and are long enough so that your skin is not exposed. Blood, mucus, and other potentially infectious material adhering to the light source could pose an infection control risk.
- Do not apply spray-type medical agents such as rubbing alcohol directly to the light source and accessories. Medical agents may enter the light source and accessories through the ventilation grills and/or the gaps and may cause a fire and/or equipment damage.
- Use a surface disinfectant cleared/approved by your national or local regulatory agencies. Furthermore, surface disinfectant cleaner should have an antiseptic solution that allows them to apply to medical products. Using an unauthorized surface disinfectant cleaner may result in insufficient disinfecting effect.
- As for the use of chemicals, be sure to follow instructions of chemicals manufacturer. Failure to follow manufacturer's instructions may result in insufficient cleaning and disinfecting effects.
- When residual organic debris attached to this product, residual organic debris will begin to dry and solidify, hindering effective removal and reprocessing efficacy.
- Wipe remaining surface disinfectant cleaner according to instructions of surface disinfectant cleaner manufacturer. Failure to do may adversely affect the human body or this instrument.
- When patient debris enters the hole or gap of this instrument, contact Olympus without using it. If you try to disinfect by force, the medicine will get inside this instrument, causing fire and malfunction of this instrument.

CAUTION

- Do not reprocessing the AC mains power inlet. Reprocessing them can deform or corrode the contacts, which could damage the light source.
- Do not soak in water and autoclave, the light source and accessories. These methods will damage them.
- Do not wipe the external surface with hard or abrasive wiping material. The surface will be scratched.
- When patient debris enters a hole or gap of the light source, contact Olympus without disinfecting it. If you try to disinfect by force, the disinfectant solution will get inside the light source causing fire and malfunction of the light source.

7.2 Surface disinfectant cleaner

Use a medical-grade hydrogen peroxide surface disinfectant cleaner with properties as shown in Table 7.1.

NOTE

- Use the surface disinfectant cleaner cleared/approved by your national regulatory agency.

Surface disinfectant cleaner	Hydrogen peroxide
Percentage solution	Undiluted solution
Disinfectant concentration	Hydrogen peroxide 1.5g/100g
Component	Hydrogen peroxide, Glycolic acid
Others	Acting as disinfectant and cleaner No rinsing required

Table 7.1 Hydrogen peroxide surface disinfectant cleaner with properties

Follow the surface disinfectant cleaner manufacturer's instructions regarding concentration, drying, temperature, contact time, use life, and expiration date. The surface disinfectant cleaner shown in Table 7.2 was used for validation.

Trade name	Type	Manufacture
Incidin™ OxyFoam S	Hydrogen Peroxide	ECOLAB

Table 7.2 Surface disinfectant cleaner used for validation

7.3 Signs of degradation from reprocessing

CAUTION

Improper reprocessing may significantly reduce the service life of the light source and accessories.

– Do not reprocessing without observing the instructions of the manufacturer.

CLV-190

If you spot any of these signs of deterioration or notice any other evidence of deterioration, contact Olympus.

– Crack appears on the panel or the Power switch.

– Discoloration on the panel or the top cover.

– Peeling of the labels on the panel.

Accessory (MAJ-1933, MAJ-1941)

If you spot any of these signs of deterioration or notice any other evidence of deterioration, dispose of the accessory.

– Crack appears on the tubing or the connector.

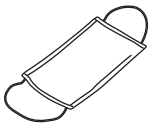
– Discoloration on the tubing or the connector.

7.4 Preparing equipment for reprocessing

■ Equipment needed

❍ Personal protective equipment

Eyewear



Face mask

Moisture-resistant cloth

Chemical-resistant gloves*1

❍ Chemicals used for reprocessing

- **Surface disinfectant cleaner**
  (Refer to Section 7.2, "Surface disinfectant cleaner"on page 95)

❍ Other

- **Clean lint-free cloths*2**

Table 7.3 Equipment needed

*1 Long sleeve gloves are recommended to prevent skin exposure.

*2 Lint-free cloths are recommended for reprocessing to prevent lint or cloth fibers from lodging or being trapped in the instrument's components.

7.5 Reprocessing the light source and accessories

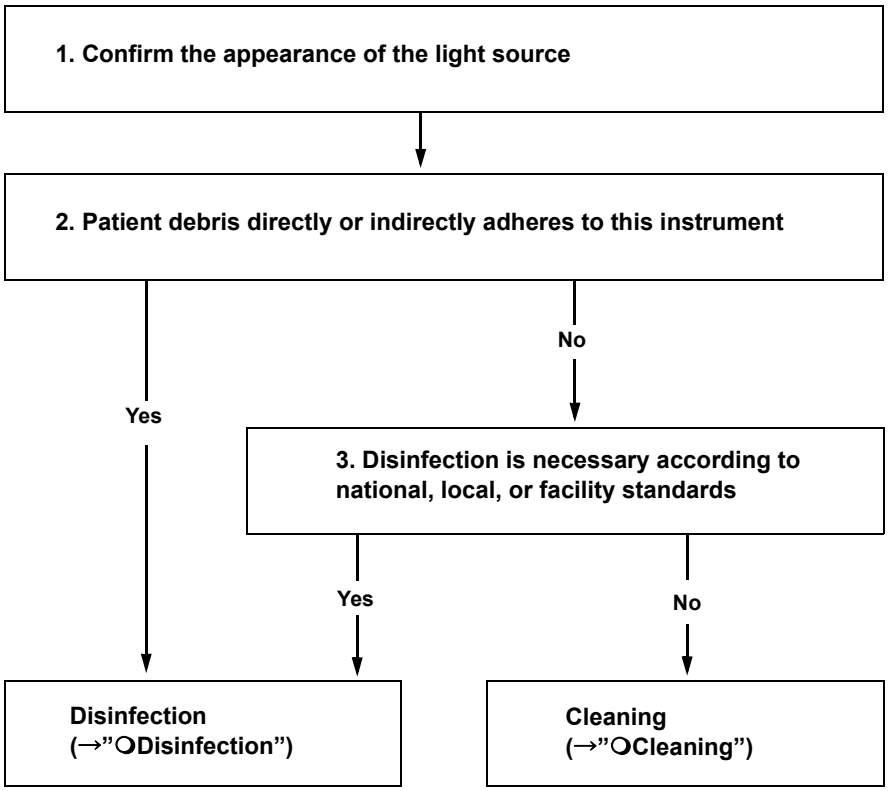
❍ Reprocessing workflow for the light source and accessories

This chapter describes the workflow for reprocessing the light source and accessories.

1 Confirm the appearance of the light source and accessories.

2 If patient debris directly or indirectly adheres to this instrument and accessories, refer to "❍ Disinfection" on page 99. Otherwise, be sure to follow the next step.

3 If disinfection is necessary according to national, local, or facility standards, refer to "❍ Disinfection" on page 99. Otherwise, refer to "❍ Cleaning" on page 100.



❍ Disinfection

WARNING

Follow the usage (temperature, contact time, use life) and amount (concentration) provided by surface disinfectant cleaner manufacturer. Failure to follow manufacturer's instructions may result in insufficient cleaning and disinfection effect.

CAUTION

- Wipe off remaining surface disinfectant cleaner solution according to instructions of surface disinfectant cleaner manufacturer. Failure to do so may adversely affect the human body or this instrument.
- After wiping with a moistened lint-free cloth, dry the light source and accessories thoroughly before using it again. If it is used while still wet, there is the risk of an electric shock.

1 Turn OFF the light source and disconnect the power cord from the hospital grade wall mains outlet.

2 Prepare a lint-free cloth moistened with the surface disinfectant cleaner.

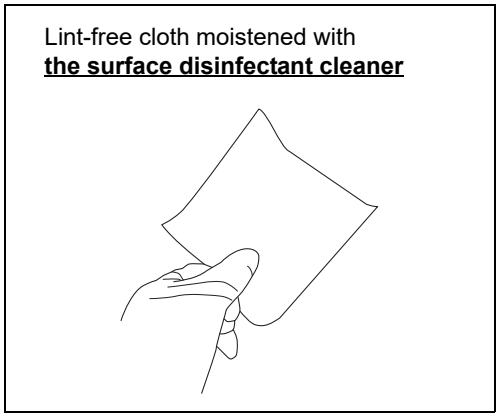


Figure 7.1

3 Wipe off all patient debris from the light source and accessories this instrument using the moistened lint-free cloth.

4 Prepare another lint-free cloth moistened with the surface disinfectant cleaner.

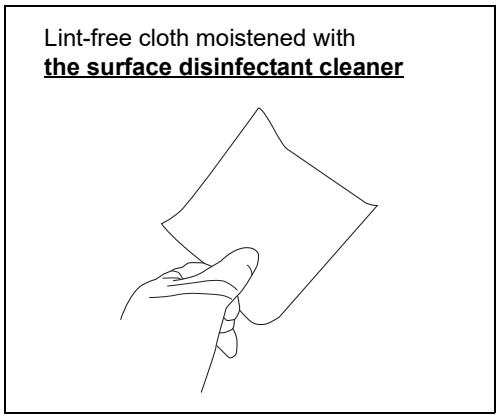


Figure 7.2

5 Disinfect the surfaces that previously contained patient debris (see Step 3) by wiping with the moistened lint-free cloth.

6 Ensure that the surfaces are completely wet for the contact time instructed by the surface disinfectant cleaner manufacturer.

7 If any surface of the light source and accessories remains wet, wipe it with a dry lint-free cloth and let it dry thoroughly.

❍ Cleaning

CAUTION

After wiping with a moistened lint-free cloth, dry the light source thoroughly before using it again. If it is used while still wet, there is the risk of an electric shock.

1 Turn the light source OFF and disconnect the power cord from the hospital grade wall mains outlet.

2 Wipe with a dry lint-free cloth or a moistened lint-free cloth with water until dust and dirt are removed.

3 If the surface of the instruments is wet, wipe it with a dry lint-free cloth and let it dry thoroughly.

7.6 Storage

WARNING

Store the light source and accessories in a proper storage cabinet, following the policies at your institution, applicable national laws and standards, and professional society guidelines and recommended practices.

CAUTION

Do not store the light source in a location exposed to direct sunlight, X-rays, radio activity, or strong electromagnetic radiation (e.g., near microwave medical treatment equipment, short-wave medical treatment equipment, MRI, radio equipment, or cellular phones). Damage to the light source may result.

1. Turn the light source OFF and disconnect the power cord from the hospital grade power outlet.
2. Store the light source properly in a clean, dustless place in compliance with the environmental conditions given in “❍ Guidance and manufacturer’s declaration — Electromagnetic immunity” on page 118.

7.7 Disposal

CAUTION

When disposing of the light source or any of its components (such as fuses), be sure to observe your national and local laws and guidelines.

7.8 Transportation

When transporting the light source and accessories, follow the policies at your institution.

Chapter 8 Troubleshooting

8.1 Troubleshooting

If any irregularity is observed during inspecting as described in Chapter 4, “Inspection” and Chapter 3, “Installation and Connection” or using as described in Chapter 5, “Operation”, do not use the light source and solve the problem as described in Section 8.2, “Troubleshooting guide”. If the problem cannot be resolved, contact Olympus.

WARNING

Never use the light source if an irregularity is observed. Damage or irregularity of the light source may result equipment damage, an electric shock, and/or burns.

8.2 Troubleshooting guide

The following table shows the possible causes of and countermeasures against troubles that may occur due to errors of settings or deterioration of consumables.
When troubles or failures other than those listed in the following table are observed, turn OFF the light source once and turn it ON again. If the problem still cannot be resolved, return the light source for repair as described in Section 8.3, “Returning the light source for repair”.

Irregularity description	Possible cause	Solution
The endoscope cannot be connected to the light source.	The endoscope is not compatible with the light source.	Connect an endoscope that is listed in the "■ System chart" on page 109.
The power fails to turn ON.	The power switch is not turned ON.	Turn the power switch ON.
	The power cord is not connected.	Connect it to a wall mains outlet as described in Section 3.8, "Connection to the AC mains power supply".
	The lamp cover is not closed firmly or removed.	Close the lamp cover firmly described in Section 6.3, "Insertion of the lamp".
	The power switch of the mobile workstation is OFF.	Turn the power switch of the mobile workstation ON.
The examination lamp does not ignite.	The examination lamp has not been ignited yet.	Press the lamp button.
	The examination lamp is not installed.	Install an examination lamp as described in Section 6.1, "Replacement of the examination (xenon) lamp".
	The examination lamp is not installed correctly.	Reinstall the examination lamp as described in Section 6.1, "Replacement of the examination (xenon) lamp".
	The examination lamp is broken.	Replace the examination lamp with a new one as described in Section 6.1, "Replacement of the examination (xenon) lamp".
	The examination light is OFF.	Turn OFF the light source and ignite the examination lamp again.
No light is emitted from the endoscope.	The examination lamp has not been ignited yet.	Press the lamp button.
	The endoscope or light guide is not connected to the output socket.	Connect the endoscope to the output socket securely as described in Section 4.4, "Connection of an endoscope".
The examination lamp does not ignite automatically when the light source is turned ON.	The manual ignition mode is selected to ignite the examination lamp.	Set the lamp ignition mode switch on the rear panel to "AUTO" as described in Section 3.5, "Selection of the lamp ignition mode".
The examination lamp ignites automatically when the light source is turned ON.	The auto ignition mode is selected to ignite the examination lamp.	Set the lamp ignition mode switch on the rear panel to "MANU" as described in Section 3.5, "Selection of the lamp ignition mode".
The examination lamp does not turn OFF even if the lamp button is pressed.	The lamp button is pressed only for a short time.	Press and hold the lamp button for 1 second or more.

Irregularity description	Possible cause	Solution
The examination lamp does not ignite, and the emergency lamp indicator lights up.	The examination lamp is not installed.	Install an examination lamp as described in Section 6.1, “Replacement of the examination (xenon) lamp”.
	The examination lamp is not installed correctly.	Reinstall the examination lamp as described in Section 6.1, “Replacement of the examination (xenon) lamp”.
	The examination lamp is broken.	Replace the examination lamp with a new one as described in Section 6.1, “Replacement of the examination (xenon) lamp”.
The emergency lamp indicator blinks.	The emergency lamp has blown or failed.	Immediately turn the light source OFF, unplug the power cord from the wall mains outlet and the power inlet, then contact Olympus.
A series of beeps is heard.	The temperature of the light source is too high.	Turn the light source OFF and confirm that the ventilation grills are not covered. Allow the light source to cool down, then turn it ON again.
The emergency lamp, instead of the examination lamp, lights up frequently.	This instrument may have already malfunctioned.	Return the instrument for repair, following Section 8.3, “Returning the light source for repair”.
The lamp usage indicator cannot be reset.	The examination lamp is lit.	Press the lamp button for more than 1 second to extinguish the examination lamp, and then press and hold the counter reset button for about 3 seconds.
	The counter reset button is pressed only for a short time.	Press and hold the counter reset button for about 3 seconds.
The brightness does not change even if the brightness buttons are pressed.	The level is set to the minimum or maximum.	Adjust the brightness to an optimum level as described in Section 5.5, “Brightness adjustment” or turn the light source OFF then ON again.

Irregularity description	Possible cause	Solution
The field of view and the image are too dark or too bright.	The examination lamp is old.	Replace the examination lamp with a new one as described in Section 6.1, “Replacement of the examination (xenon) lamp”.
	The emergency lamp is active.	Replace the examination lamp with a new one as described in Section 6.1, “Replacement of the examination (xenon) lamp”.
	The endoscope or light guide is not connected to the output socket.	Connect the endoscope to the output socket securely as described in Section 4.4, “Connection of an endoscope”.
	The brightness is unsuitable.	Adjust the brightness to a suitable level as described in Section 5.5, “Brightness adjustment”.
	Transillumination is activated.	Wait for auto return to the original level (in about 7 seconds) or press the transillumination button again.
	The video system center and/or light source cable is connected improperly.	Connect the video system center and light source cable properly.
	The video system center is OFF.	Turn ON the video system center.
	The NBI mode is set.	Press the observation mode button to return to the normal observation mode.
	The objective lens is dirty	Remove debris on the objective lens according to the instruction manual for the endoscope.
The visual field and image color become red/green/blue when an OES fiber endoscope is used.	The brightness mode is set to “AUTO”.	Set the brightness mode to “MANU” as described in Section 5.4, “Setting the brightness mode”.
The field of view and image color are poor.	The emergency lamp is active.	Replace the examination lamp with a new one as described in Section 6.1, “Replacement of the examination (xenon) lamp”.
	A observation mode is set.	Press the observation mode button to return to the normal observation mode.
The transillumination function cannot be activated.	The endoscope is not connected to the output socket.	Connect the endoscope to the output socket securely as described in Section 4.4, “Connection of an endoscope”.
	A light guide is connected to the output socket, or an incompatible endoscope is connected to the output socket.	Connect the endoscope with the transillumination function compatibility as described in Section 4.12, “Inspection of the high intensity mode”.

Irregularity description	Possible cause	Solution
The high intensity mode cannot be set.	An incompatible endoscope or light guide is connected to the output socket.	Connect an endoscope or light guide cable with high intensity mode compatibility as described in Section 4.12, “Inspection of the high intensity mode”
The air/water feeding is not being operated.	The air pump incorporated in the light source is not working.	Operate the air/water feeding function as described in Section 5.9, “Air/water feeding”.
	The endoscope is not connected to the output socket.	Connect the endoscope to the output socket securely as described in Section 4.4, “Connection of an endoscope”.
	The light guide is connected to the output socket.	Connect the light guide to an endoscope with the air-feeding function.
NBI observation is disabled.	An incompatible endoscope is connected.	Connect the endoscope compatible with the NBI observation.
	An incompatible light source cable is connected.	Connect the light source cable correctly as described in Section 3.6, “Connection of the video system center”.
	The NBI observation mode is not selected.	Press the observation mode button or the observation mode select button to select the NBI observation mode.
The endoscopic image is not displayed on the monitor.	Foreign objects such as detergent remnants, hard water residue, finger grease, dust, and lint are on the electrical contacts.	Wipe the electrical contacts on the endoscope connector using clean lint-free cloths moistened with 70% ethyl or 70% isopropyl alcohol and completely dry them. After drying them, connect the endoscope to the light source.
The “Endoscope model” is not displayed on the monitor.	Foreign objects such as detergent remnants, hard water residue, finger grease, dust, and lint are on the electrical contacts.	Wipe the electrical contacts on the endoscope connector using clean lint-free cloths moistened with 70% ethyl or 70% isopropyl alcohol and completely dry them. After drying them. connect the endoscope to the light source.

8.3 Returning the light source for repair

When returning the light source for repair, contact Olympus. With the light source, include a description of the malfunction or damage and the name and telephone number of the individual at your location who is the most familiar with the problem. Also, include a repair purchase order.

CAUTION

Olympus is not liable for any injury or damage that occurs as a result of repairs attempted by non-Olympus personnel.

NOTE

If an accessory of the light source (e.g., examination lamp, foot holder, power cord, light source cable etc.) needs to be replaced, contact Olympus to purchase a replacement.

Appendix

Combination equipment

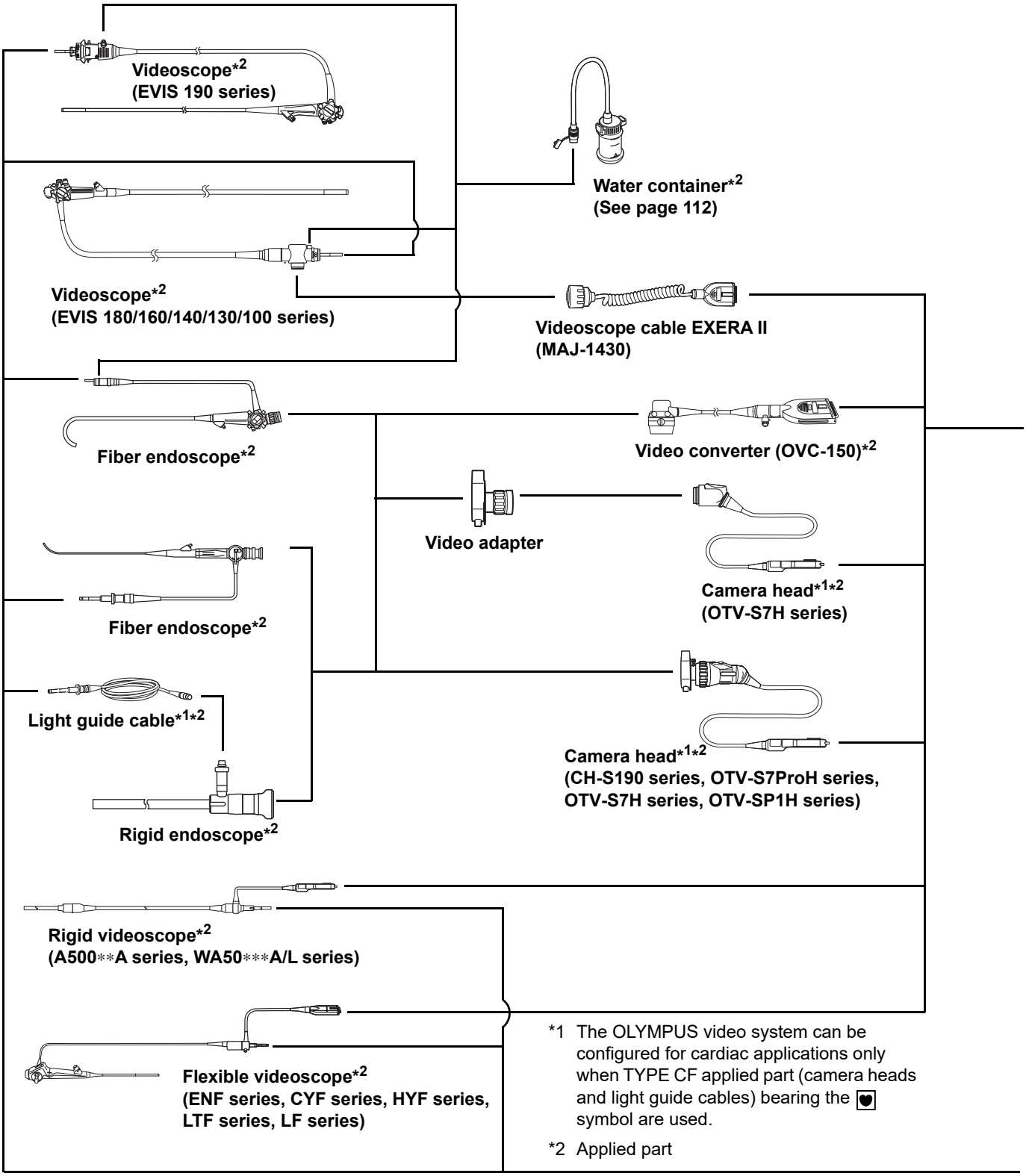
■ System chart

The recommended combinations of equipment and accessories that can be used with the light source are listed below. Additional equipment connected to the device must comply with the respective IEC or ISO standards (e.g. IEC 60950 for data processing equipment). Furthermore all configurations shall comply with the requirements for medical electrical systems (see IEC 60601-1-1 or clause 16 of the 3Ed. of IEC 60601-1, respectively). New products released after the introduction of the light source may also be compatible for use in combination with the light source. For further details, contact Olympus.

Products included in the system chart are adapted for use in a patient environment.

WARNING

If combinations of equipment other than those shown below are used, the full responsibility is assumed by the medical treatment facility.

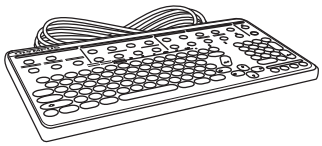


*1 The OLYMPUS video system can be configured for cardiac applications only when TYPE CF applied part (camera heads and light guide cables) bearing the ♥ symbol are used.

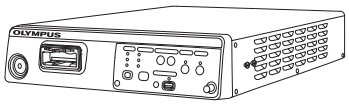
*2 Applied part

The OLYMPUS video system can be configured for cardiac applications only when TYPE CF applied part (camera heads and light guide cables) bearing the ♥ symbol are used.

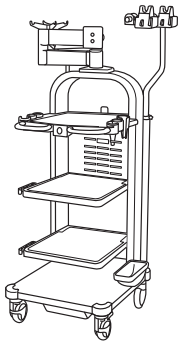
High-definition LCD monitor (OEV261H, OEV191H)
High-definition monitor (OEV181H)
LCD monitor (OEV191)



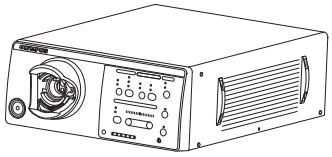
Keyboard (MAJ-1924, MAJ-1922, MAJ-1921)



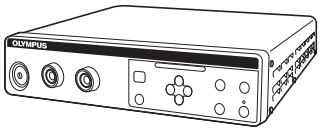
EVIS EXERA III Video system center (CV-190, OTV-S190)



Mobile workstation (WM-NP2, WM-DP2, WM-NP1, WM-WP1)



EVIS EXERA III Xenon light source (CLV-190)



Endoscope position detecting unit (UPD-3)

■ *Water container*

BF endoscopes do not use the water container.

Endoscope	Water container					
	MAJ-901	MAJ-902	MH-884	MH-970	MD-431	MA-995
EVIS EXERA III 190 series EVIS EXERA II 180 series EVIS EXERA 160 series EVIS 140 series	○	○	○	○	–	–
EVIS 100 series	–	–	–	–	○	○
OES 40 series	○	○	○	○	–	–
OES 30 series OES 20 series OES 10 series	–	–	–	–	○	○
Ultrasonic endoscope UM60 series Ultrasonic endoscope UC60 series	○	–	○	–	–	–

○ compatible – not compatible

The water container packaged with the light source is MAJ-901.

Transportation, storage, and operating environments

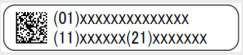
Operating environment	**Ambient temperature**	10 – 40°C (50 – 104°F)
	Relative humidity	30 – 85% (without condensation)
	Atmospheric pressure	700 – 1060 hPa (0.7 – 1.1 kgf/cm^2) (10.2 – 15.4 psia)
Standard storage environment (e.g. within the hospital)	**Ambient temperature**	5 – 40°C (41 – 104°F)
	Relative humidity	10 – 90% (without condensation)
	Atmospheric Pressure	700 – 1060 hPa (0.7 – 1.1 kgf/cm^2) (10.2 – 15.4 psia)
Transportation and storage environment	**Ambient temperature**	–25 to +70°C (–13 to +158°F)
	Relative humidity	10 – 90%
	Atmospheric pressure	700 – 1060 hPa (0.7 – 1.1 kgf/cm^2) (10.2 – 15.4 psia)

Specifications

Power input	**Power input Rated voltage**	100 – 240 V AC
	Voltage fluctuation	Within ±10%
	Rated frequency	50/60 Hz
	Frequency fluctuation	Within ±1 Hz
	Rated input	600 VA
Size	**Dimensions**	370 (W) × 150 (H) × 476 (D) mm (standard)
		390 (W) × 162 (H) × 551 (D) mm (maximum)
	Weight	19 kg

Illumination	**Examination lamp**	Xenon short-arc lamp (ozone-free) 300 W
	Average lamp life	Approximately 500 hours of continuous use (with intermittent use, the lamp life may vary slightly.)
	Ignition method	Switching regulator
	Brightness adjustment	Light-path diaphragm control
	Cooling	Forced-air cooling
	Intensity mode	Normal or high intensity
	NBI observation	Available
	Color conversion	Possible using special-purpose filter.
	Emergency lamp	Halogen lamp (within mirror) 12 V 35 W
	Average emergency lamp life	Approximately 500 hours
Automatic brightness adjustment	**Automatic brightness adjustment method**	Servo-diaphragm method
	Automatic exposure	17 steps
Air-feeding	**Pump**	Diaphragm type pump
	Pressure switching	4-level available (OFF, low, medium, high)
Water feeding	**Method**	Feeds water by pressurizing the detachable water container with air.
Indicators on front panel	**Emergency lamp**	Indicates absence of emergency lamp, disconnection and use of emergency lamp.
	NBI	When the NBI observation mode is enabled, the observation mode indicator lights up.
	OP	It lights up if a special-purpose filter is installed into the light source.
Setting memory		Settings (except the filter setting) are stored even when the light source is OFF.
Classification (medical electrical equipment)	**Type of protection against electric shock**	Class I
	Degree of protection against electric shock of applied part	Depend on applied part. See also applied part (camera head or videoscope).
	Degree of protection against explosion	The light source should be kept away from flammable gases.

Medical Devices Directive		CE 0197 This device complies with the requirements of Directive 93/42/EEC concerning medical devices. Classification: Class II a
RoHS Directive		CE This device complies with the requirements of Directive 2011/65/EU concerning electrical and electronic equipment.
WEEE Directive		 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 municipal waste, but should be collected separately. Refer to your local Olympus distributor for return and/or collection systems available in your country.
CSA/UL mark		 This device complies with UL 60601-1: 2003 and CSA C22.2 No. 601.1
EMC	**Applied standard**	IEC 60601-1-2: 2001 IEC 60601-1-2: 2007 IEC 60601-1-2: 2014 • This instrument complies with the EMC standard for medical electrical equipment, edition 4 (IEC 60601-1-2: 2014). When connecting to an instrument that complies with a previous edition of the EMC standard for medical electrical equipment edition, the EMC characteristics could be vulnerable. • CISPR 11 of emission: Group 1, Class B

UDI label 	**Indication**	The UDI label is required by some countries' regulations regarding the identification of a medical device also known as Unique Device Identification (UDI). The following information is being coded in the 2-dimensional barcode (GS1 Data Matrix): - (01) 14-digit GS1 Global Trade Item Number; - (11) 6-digit date of manufacture; - (21) 7-digit serial number.
Date of manufacture 	**Indication**	Date of manufacture of the device body YYYY-MM-DD (Year-month-date)

EMC information

Guidance and manufacturer's declaration — Electromagnetic emissions

This model is intended for use by medical personnel in hospital environments and for use in the electromagnetic environment specified below. The customer or the user of this model should assure that it is used in such an environment.

Emission standard	Compliance	Guidance
RF emissions CISPR 11	Group 1	This instrument uses RF (Radio Frequency) 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.
Radiated emissions CISPR 11	Class B	This instrument's RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
Main terminal conducted emissions CISPR 11		
Harmonic emissions IEC 61000-3-2	Class A	This instrument's harmonic emissions are low and are not likely to cause any problem in the typical commercial power supply connected to this instrument.
Voltage fluctuations/flicker emissions IEC 61000-3-3	Complies	This instrument stabilizes its own radio variability and has no effect such as flicker in lighting apparatus.

Guidance and manufacturer's declaration — Electromagnetic immunity

This model is intended for use by medical personnel in hospital environments and for use in the electromagnetic environment specified below. The customer or the user of this model should assure that it is used in such an environment.
This instrument can be used with the high-frequency electrosurgical equipment that designated by Olympus.

Immunity test	IEC 60601-1-2 (2014) test level	IEC 60601-1-2 (2007, 2001) test level	Compliance level	IEC 60601-1-2 (2007, 2001) Electromagnetic environment — Guidance
Electrostatic discharge (ESD) IEC 61000-4-2	Contact: ±8 kV Air: ±2, ±4, ±8, ±15 kV	Contact: ±2, ±4, ±6 kV Air: ±2, ±4, ±8 kV	Same as left	Floors should be made of wood, concrete, or ceramic tile that hardly produces static. If floors are covered with synthetic material that tends to produce static, the relative humidity should be at least 30%.
Electrical fast transient/burst IEC 61000-4-4	±2 kV for power supply lines ±1 kV for input/output lines	±2 kV for power supply lines ±1 kV for input/output lines	Same as left	Mains power quality should be that of a typical commercial (original condition feeding the facilities) or hospital environment.
Surge IEC 61000-4-5	Differential mode: ±0.5, ±1 kV Common mode: ±0.5, ±1, ±2 kV for signal input/ output lines: ±2 kV	Differential mode: ±0.5, ±1 kV Common mode: ±0.5, ±1, ±2 kV	Same as left	Mains power quality should be that of a typical commercial or hospital environment.

Immunity test	IEC 60601-1-2 (2014) test level	IEC 60601-1-2 (2007, 2001) test level	Compliance level	IEC 60601-1-2 (2007, 2001) Electromagnetic environment — Guidance
Voltage dips, short interruptions, and voltage variations on power supply input lines IEC 61000-4-11	0% U_T (100% dip in U_T) for 0.5 cycle/1 cycle	< 5% U_T (> 95% dip in U_T) for 0.5 cycle	Same as left	Mains power quality should be that of a typical commercial or hospital environment. If the user of this instrument requires continued operation during power mains interruptions, it is recommended that this instrument be powered from an uninterruptible power supply or a battery.
	–	40% U_T (60% dip in U_T) for 5 cycle		
	70% U_T (30% dip in U_T) for 25 cycle (50 Hz)/ 30 cycle (60 Hz) Phase angle causing voltage dips: 0°	70% U_T (30% dip in U_T) for 25 cycle		
	0% U_T (100% dip in U_T) for 250 cycle (50 Hz)/ 300 cycle (60 Hz)	< 5% U_T (> 95% dip in U_T) for 5 seconds		
	U_T is the a.c. mains voltage prior to application of the test level.			
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	30 A/m (50 Hz or 60 Hz)	3 A/m (50 Hz, 60 Hz)	Same as left	It is recommended to use this instrument by maintaining enough distance from any equipment that operates with high current.

<table>
<tr><th>Immunity test</th><th>IEC 60601-1-2 (2014) test level</th><th>IEC 60601-1-2 (2007, 2001) test level</th><th>Compliance level</th><th>IEC 60601-1-2 (2007, 2001) Electromagnetic environment — Guidance</th></tr>
<tr><td rowspan="3">Conducted RF
IEC 61000-4-6</td><td>3V
(150 kHz – 80 MHz)</td><td>3V (V_1)
(150 kHz – 80 MHz)</td><td>Same as left</td><td rowspan="2">Recommended separation distance
$d = \left[\frac{3,5}{V_1}\right]\sqrt{P}$
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].</td></tr>
<tr><td>6V
(ISM band of 150 kHz – 80 MHz)</td><td>–</td><td>Same as left</td></tr>
<tr><td colspan="4">ISM (industry, science, and medical care) band of 6.765 MHz – 6.795 MHz, 13.553 MHz – 13.567 MHz, 26.957 MHz – 27.283 MHz, and 40.66 MHz – 40.70 MHz between 0.15 MHz and 80 MHz</td></tr>
<tr><td>Radiated RF
IEC 61000-4-3</td><td>3V/m (80 MHz – 2.7 GHz)</td><td>3V/m (E_1)
(80 MHz – 2.5 GHz)</td><td>Same as left</td><td rowspan="2">Recommended separation distance
$d = \left[\frac{3,5}{E_1}\right]\sqrt{P}$
80 MHz – 800 MHz
$d = \left[\frac{7}{E_1}\right]\sqrt{P}$
800 MHz – 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].</td></tr>
<tr><td>Proximity magnetic field from RF communication equipment
IEC 61000-4-3</td><td>Refer to the table of the next page.</td><td>–</td><td>Same as left</td></tr>
</table>

NOTE

- At 80 MHz and 800 MHz, the higher frequency range applies.
- These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.
- Electromagnetic interference may occur in the vicinity of high-frequency electrosurgical equipment and/or other equipment marked with the following symbol:

NOTE

- Field strength from fixed RF transmitters as determined by an electromagnetic site survey[a)] should be less than the compliance level in each frequency range[b)].

a) Field strength 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 this model is used exceeds the applicable RF compliance level above, this model should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating this model.

b) Over the frequency range 150 kHz to 80 MHz, field strength should be less than 3 V/m.

Test frequency [MHz]	Band [MHz]	Modulation*1	Maximum power [W]	Immunity test level [V/m]
385	380 – 390	Pulse modulation*1 18 Hz	1.8	27
450	430 – 470	FM ±5 kHz deviation 1 kHz sine	2	28
710	704 – 787	Pulse modulation*1 217 Hz	0.2	9
745				
780				
810	800 – 960	Pulse modulation*1 18 Hz	2	28
870				
930				
1720	1700 – 1990	Pulse modulation*1 217 Hz	2	28
1845				
1970				
2450	2400 – 2570	Pulse modulation*1 217 Hz	2	28
5240	5100 – 5800	Pulse modulation*1 217 Hz	0.2	9
5500				
5785				

*1 The carrier shall be modulated using a 50% duty cycle square wave signal.

WARNING

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 this instrument, including cables specified by Olympus. Otherwise, degradation of the performance of this equipment could result.

OLYMPUS

Manufactured by

OLYMPUS MEDICAL SYSTEMS CORP.
2951 Ishikawa-cho, Hachioji-shi, Tokyo 192-8507, Japan
Fax: (042)646-2429 Telephone: (042)642-2111

Distributed by

OLYMPUS AMERICA INC.
3500 Corporate Parkway, P.O. Box 610, Center Valley, PA
18034-0610, U.S.A.
Fax: (484)896-7128 Telephone: (484)896-5000

OLYMPUS LATIN AMERICA, INC.
5301 Blue Lagoon Drive, Suite 290 Miami, FL 33126-2097, U.S.A.
Fax: (305)261-4421 Telephone: (305)266-2332

EC REP **OLYMPUS EUROPA SE & CO. KG**
(Premises/Goods delivery) Wendenstrasse 20, 20097 Hamburg, Germany
(Letters) Postfach 10 49 08, 20034 Hamburg, Germany
Fax: (040)23773-4656 Telephone: (040)23773-0

KEYMED (MEDICAL & INDUSTRIAL EQUIPMENT) LTD.
KeyMed House, Stock Road, Southend-on-Sea, Essex SS2 5QH, United Kingdom
Fax: (01702)465677 Telephone: (01702)616333

OLYMPUS MOSCOW LIMITED LIABILITY COMPANY
Elektrozavodskaya str. 27 bld.8, 107023 Moscow, Russia
Fax: (7)495-926-7072 Telephone: (7)495-926-7077

OLYMPUS (BEIJING) SALES & SERVICE CO., LTD.
A8F, Ping An International Financial Center, No. 1-3, Xinyuan South Road,
Chaoyang District, Beijing, 100027 P.R.C.
Fax: (86)10-5976-1299 Telephone: (86)10-5819-9000

OLYMPUS KOREA CO., LTD.
(Seocho-dong, Majestar City Tower One), 2F & 3F, 12, Seocho-daero 38-gil, Seocho-gu,
Seoul, 06655, Republic of Korea
Fax: (02)6255-3210 Telephone: 1544-3200

OLYMPUS SINGAPORE PTE LTD
438B Alexandra Road #03-07/12, Alexandra Technopark Blk B, Singapore 119968
Fax: 6834-2438 Telephone: 6834-0010

OLYMPUS AUSTRALIA PTY LTD
3 Acacia Place, Notting Hill, VIC 3168, Australia
Fax: (03)9543-1350 Telephone: (03)9265-5400

Printed in Japan 20211118 *0000