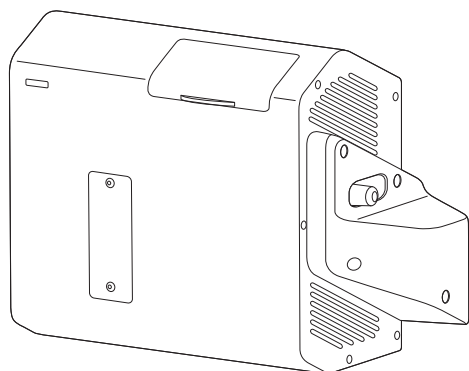


INSTRUCTIONS

ORBEYE LED LIGHT SOURCE

OME-L200



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Labels and Symbols

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

○ Side panel

Light guide terminal caution

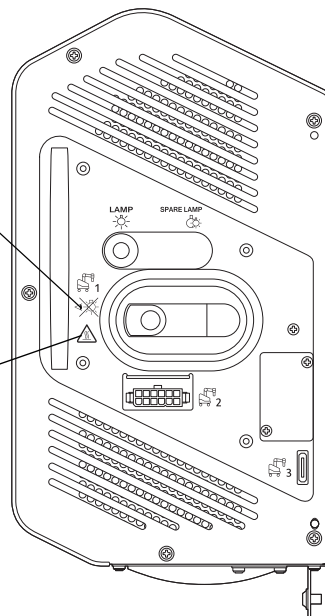


Caution symbol not to look into the light guide terminal while the lamp is lit.

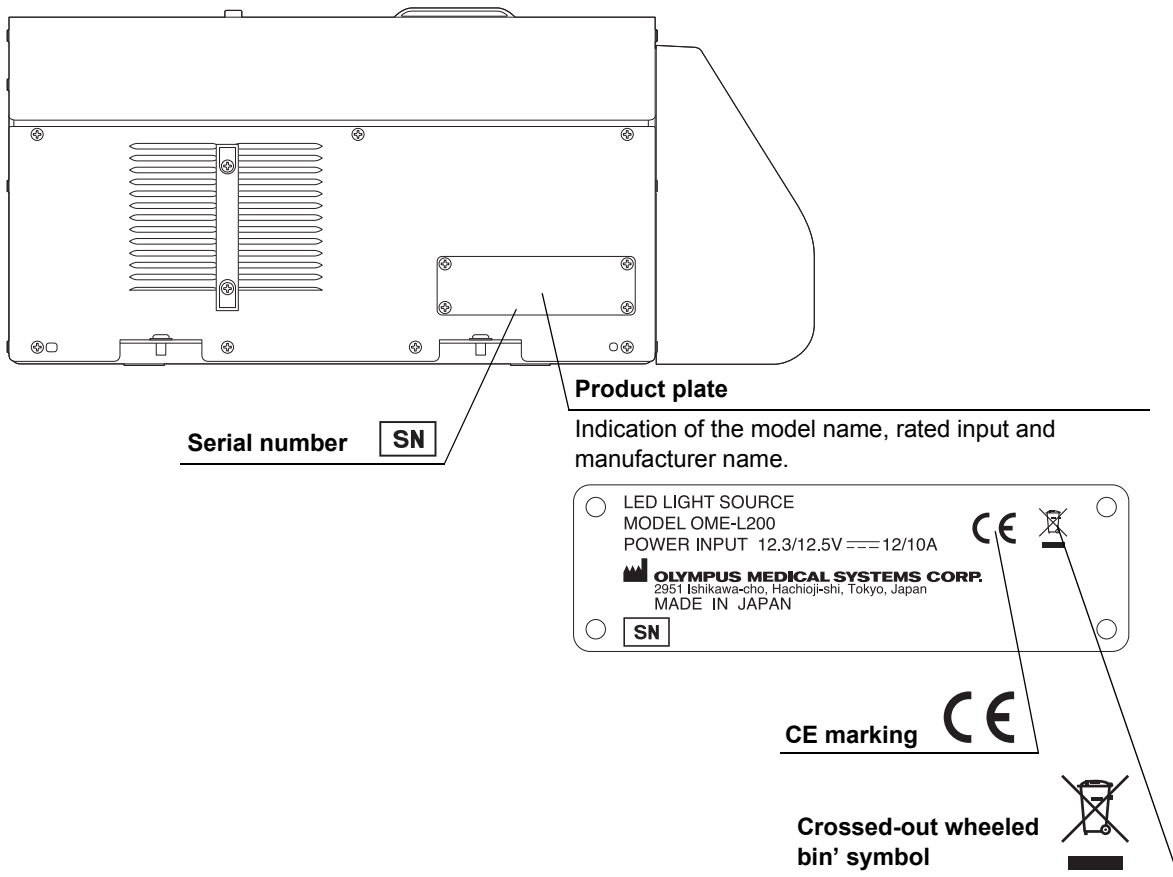
Light guide cable port temperature caution



Caution symbol not to touch the light guide cable port while it is hot immediately after extinguishing the light.



○ Bottom panel



○ Back cover of this instruction manual

Symbol	Description	Symbol	Description
	Manufacturer		Authorized representative in the European Community

Important Information — Please Read Before Use

■ ***Intended use***

The light source has been designed to be used with Olympus Surgical Microscope for use in magnified observation and recording of surgical sites.

■ ***Instruction manual***

This instruction manual contains essential information on using this instrument safely and effectively. Before use, thoroughly review this manual and the manuals for ancillary 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 about any information in this manual, contact Olympus.

○ **Terms used in this manual**

ORBEYE Surgical microscope (OME-V200)

The surgical microscope designated by Olympus to be used in combination with this instrument.

Automatic brightness control

Function that automatically adjusts illumination light to keep the image brightness constant even when the observation conditions such as the working distance and magnification change.

Hospital grade wall mains outlet

The hospital grade wall mains outlet is a wall AC mains power outlet socket having the exclusive terminal for grounding.

Light guide cable

The cable formed by bundling several optical fibers. Used to transmit the light emitted from this instrument to the illumination lens of the surgical microscope.

Spare lamp

This is light source used temporarily in the case of failure of this instrument.

■ ***User qualifications***

The operator of this instrument must be a physician or medical personnel under the supervision of a physician and must have received sufficient training in clinical procedures of microsurgery using surgical microscopes. This manual, therefore, does not explain or discuss the details of microsurgery using surgical microscopes.

For details of microsurgery using surgical microscopes, the physician and operator are requested to judge from their viewpoints as specialists.

■ ***Instrument compatibility***

This instrument should be used in combination with the ancillary equipment shown in “■ System chart” on page 55. Using incompatible equipment can result in patient or operator injury and/or equipment damage as well as malfunction.

This instrument complies with EMC standard for medical electrical equipment edition 4 (IEC 60601-1-2: 2014).

■ ***Spare equipment***

To avoid interruption of procedure due to an unexpected event such as equipment failure in the middle of operation, be sure to hold ready the spare equipment.

■ ***Prohibition of improper repair and modification***

Never allow a person other than Olympus-qualified personnel to disassemble or modify the instrument, as this may result in injury of the patient or operator as well as damage to the equipment. Olympus will not assume any liability for human accidents or equipment damage occurred due to repair by a person other than Olympus-qualified personnel.

■ Signal words

The following signal words are used throughout this manual:

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.

■ Precautions

Follow the warnings and cautions given below when handling this instrument. This information is to be supplemented by the warnings and cautions given in each chapter.

WARNING

- Strictly observe the following precautions. Failure to do so may place the patient and medical personnel in danger of an electric shock.
 - Do not souse or spill a liquid such as water over this instrument. Should a liquid penetrate this instrument, immediately stop using it and contact Olympus.
 - Do not prepare, inspect, or use this instrument with wet hands.
- Never install and operate this instrument in locations where:
 - The concentration of oxygen is high;
 - Oxidizing agents (such as nitrous oxide (N₂O)) are present in the atmosphere;
 - Flammable gases are present in the atmosphere;
 - Flammable liquids are near.

Otherwise, explosion or a fire may result because this instrument is not explosion-proof.
- Do not use the equipment for ophthalmic surgery or during procedures in which the illumination may make direct contact with the patient's eye. The strong illumination can injure the retina.

WARNING

- Do not use for purposes other than those described in “■ Intended use” on page 3, as this may result in injury of the patient or operator as well as damage to the equipment.
- This instrument should be used under the conditions specified in “■ Environments” on page 57. Otherwise, imperilment of safety or failure of equipment may result as well as malfunction.
- This product may interfere with other medical electric equipment used in combination with it. Before use, refer to the “Appendix” to confirm the compatibility of this instrument with all equipment to be used.

CAUTION

- Observe the following warnings on the illumination light emitted from the illumination lens of the surgical microscope. It may produce organic changes of living body, including protein degeneration, tissue drying and burns, if it is used erroneously.
 - Always be careful not to cause drying or burns of the observed region.
The brightness observed on the monitor may sometimes differ from the actual brightness of the light emitted from the surgical microscope.
Usually, the auto brightness control function maintains the illumination light at optimum brightness. However, when the spare lamp is used, adjust the brightness always at an optimum level by controlling the spare lamp brightness control knob.
 - Always use the equipment for the minimum required period.
The illumination light has a potential of exerting unfavorable effects to the living tissues. Be sure to limit the time of irradiation on the observed region at minimum.
 - Reserve a sufficient working distance.
If the illumination is incident with the observed region and surrounding tissues for an extended period while the working distance of the surgical microscope is set shorter than required, increased irradiation on the living tissues may exert unfavorable effects on them. To prevent this, be careful not to use a shorter working distance than necessary.
 - Cool the tissues that tend to dry early or be affected by heat.
If the observed region has a drying tendency or concerns related to affection by heat, take a measure to cool the living tissues in addition to the countermeasures against the warnings above. The method of cooling includes frequent pouring of saline and coverage with sterilized wet gauze. A similar cooling measure is also required when the illumination is incident to the living tissues outside the observed region.

CAUTION

- Do not insert an object through the ventilation grilles of the instrument. Otherwise, equipment damage or operator injury may result.
- Do not look directly at the light guide terminal of this instrument or the illumination lens of the surgical microscope while the illumination lamp is lit. Also, do not point the illumination lens to others. Otherwise, an eye injury may result.
- Do not touch the extremity of the light guide cable after it has been disconnected from this instrument. Otherwise, the high temperature immediately after use may cause burns.
- Do not use this instrument in any place where it may be subject to strong electromagnetic radiation (for example, in the vicinity of a microwave therapeutic equipment, MRI, wireless set, short-wave therapeutic equipment, cellular/portable phone, etc.). This may impair the performance of this instrument.
- Do not use this instrument in any place with strong magnetic force, or bring magnetized equipment or magnets closer. This may impair the performance of this instrument.
- Connect various connectors in a dry state without contamination of electrical contacts. Also, do not touch the electrical contacts inside the connector directly. If the electrical contacts are dirty or used under wet conditions, the equipment may malfunction.
- Do not block the ventilation grilles of this instrument with a cloth, etc. Otherwise, insufficient cooling may cause stoppage of this instrument or failure of equipment.
- Do not press a switch on this instrument with a sharp or too hard object. Otherwise, equipment damage or failure may result.
- Do not apply an excessive force or strong impact to this instrument, ancillary equipment, and cables. Otherwise, equipment damage or failure may result.
- Electromagnetic interference may occur on this instrument 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 this instrument, or shielding the location.



NOTE

- The spare lamp should be used only in the case of emergency. Note that some functions including the automatic brightness control are unavailable during use of the spare lamp.
- Icons of startup indicator are displayed on four corners of the observation monitor screen for ten to twenty seconds after the power is turned ON on the surgical microscope. Afterwards the icons will disappear. These icons are displayed until the setup of this instrument has completed and does not mean malfunction.

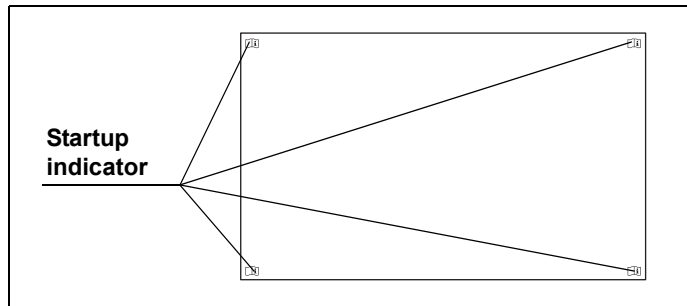


Figure 1

Summary of Equipment Functions

For details of the functions, also refer to the instruction manuals of ancillary equipment as well as to the present manual.

○ Lighting of illumination light

This instrument supplies the light from its built-in illumination lamp to the surgical microscope.
→Refer to Section 5.2, "Turning the instrument and illumination lamp ON".

○ Lighting of spare lamp

This instrument supplies the light from the built-in spare lamp to the surgical microscope.
→Refer to "■ Lighting of spare lamp" on page 51.

○ Adjustment of the spare lamp brightness

When the spare lamp is used, its brightness can be controlled manually using the spare lamp brightness control knob on the control panel.
→Refer to "■ Control of spare lamp brightness" on page 52.

| Summary of Equipment Functions

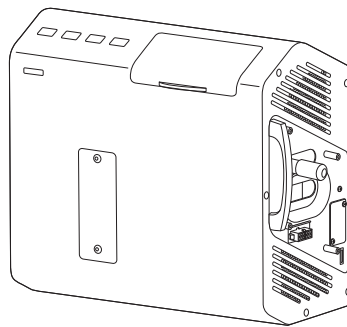
Chapter 1 Checking the Package Contents

1.1 Checking the Package Contents

Ch.1

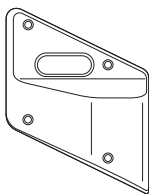
Confirm that the LED light source and its accessories are present by matching all items in the package with the components shown below. Inspect each item for damage. If the instrument is damaged, a component is missing, or you have any questions, do not use the instrument; immediately contact Olympus.

○ LED light source

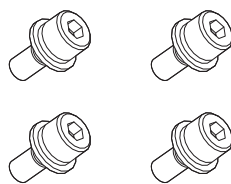


LED light source (OME-L200)

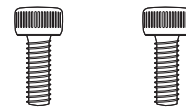
○ Accessories



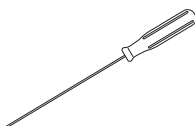
Cable cover



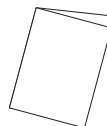
Lock screws (M4 × 10 mm) (× 4)



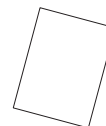
Retaining screws (M5 × 8 mm) (× 2)



Allen screwdriver
(3 mm width across flats,
160 mm axial length)



Instruction manual (This book)



Quick reference guide

| 1.1 Checking the Package Contents

Ch.1







Chapter 2 Nomenclature and Functions

This chapter is intended to explain the names and functions of the parts of the LED light source.








2.1 Symbols and descriptions

○ Control panel


Ch.2

Symbol	Description	Symbol	Description
	Power ON		Power OFF
	Brightness control		Spare lamp

○ Side panel


Symbol	Description	Symbol	Description
	Main lamp		Spare lamp
	Light guide terminal caution		Light guide cable port temperature caution
	Light guide terminal		Power supply terminal
	Communication terminal		

○ Front panel



Symbol	Description
	Option unit mounting cover

2.2 Explained parts

○ Bottom panel

Symbol	Description
	Direct current

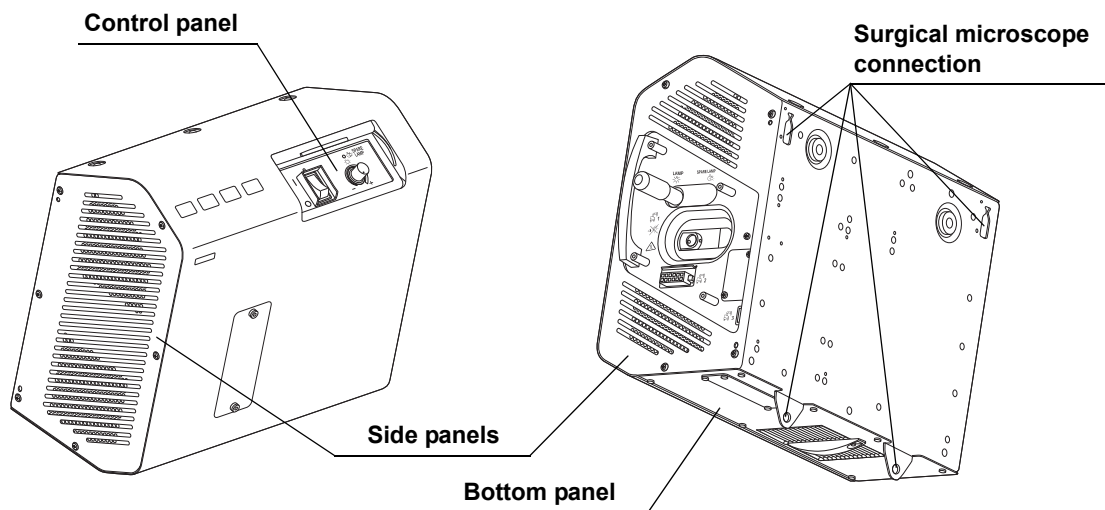
○ Cable cover

Symbol	Description	Symbol	Description
	Main lamp		Spare lamp

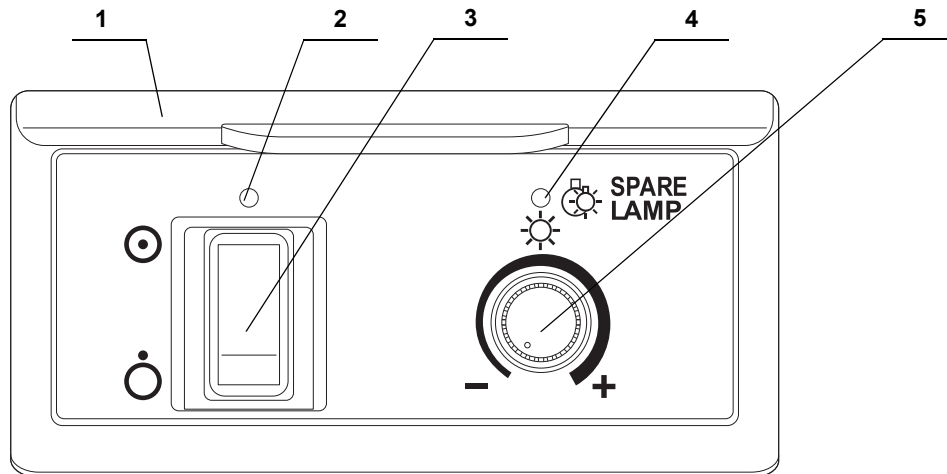
Ch.2

2.2 Explained parts

The names and functions of the control panel, side panels, bottom panel, and surgical microscope connection are described.



2.3 Control panel

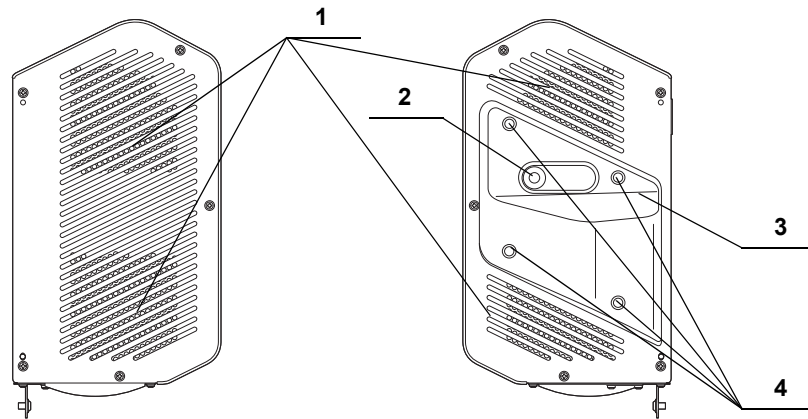


Ch.2

No.	Name	Description
1	Slide cover	Slide this cover upward to open it and use the control panel.
2	Power indicator	Lights green when the power supply is ON.
3	Power switch	Press the upper segment to switch the power ON and the lower segment to switch it OFF.
4	Spare lamp lighting indicator	Lights amber when the spare lamp is used (lit).
5	Spare lamp brightness control knob	During use of the spare lamp, its brightness can be adjusted by rotating this knob. Rotating toward + increases the brightness and toward – decreases it.

2.4 Side panel

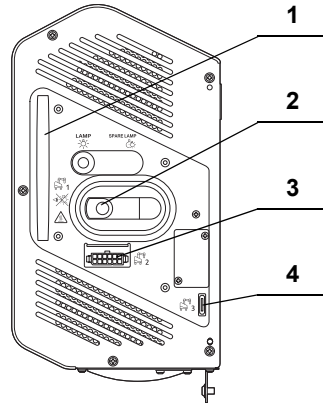
○ View when the cable cover is attached



Ch.2

No.	Name	Description
1	Ventilation grilles	Introduce air inside this instrument to cool it.
2	Spare lamp selector lever	Slide this lever to the left or right to switch the lamp between the main and spare lamps.
3	Cable cover	Used to protect the cables connected to this instrument.
4	Attaching holes	Used to attach the cable cover to this instrument with the provided lock screws (M4 × 10 mm).

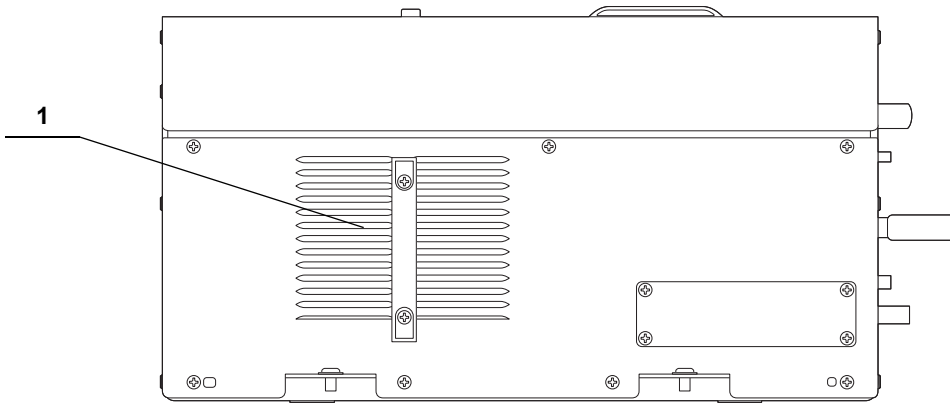
○ View when the cable cover is detached



Ch.2

No.	Name	Description
1	Carrying handle	Hold this part when carrying this instrument.
2	Light guide terminal	Connect the light guide cable of the surgical microscope to supply the illumination light to it.
3	Power supply terminal	Connect the power cable of the surgical microscope to supply DC power to this instrument.
4	Communication terminal	Connect the communication cable of the surgical microscope to exchange the communication signals.

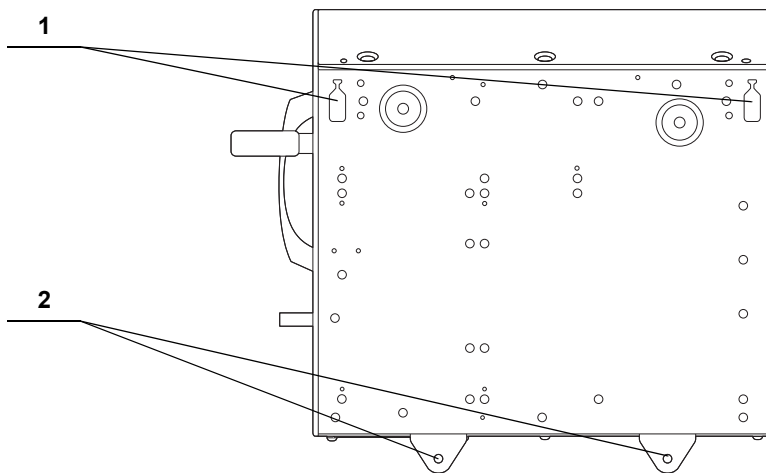
2.5 Bottom panel



Ch.2

No.	Name	Description
1	Ventilation grilles	Exhausts the air inside this instrument to cool it.

2.6 Surgical microscope connection



No.	Name	Description
1	Connection hook holes	Used to insert the connection hooks of the surgical microscope.
2	Attaching holes	Used to attach this instrument to the surgical microscope with the provided lock screws (M5 × 8 mm).

Chapter 3 *Installation and Connection*

Prepare this instrument and the ancillary equipment according to the purpose of use as shown in “■ System chart” on page 55.

Also, read the instruction manual for each piece of ancillary equipment and connect this instrument and the ancillary equipment in the order given in this chapter.

3.1 *Precautions for installation and connection*

WARNING

Before use, be sure to read this chapter and prepare the ancillary equipment optimally. Otherwise, patient or operator injury may result as well as malfunctions of the equipment.

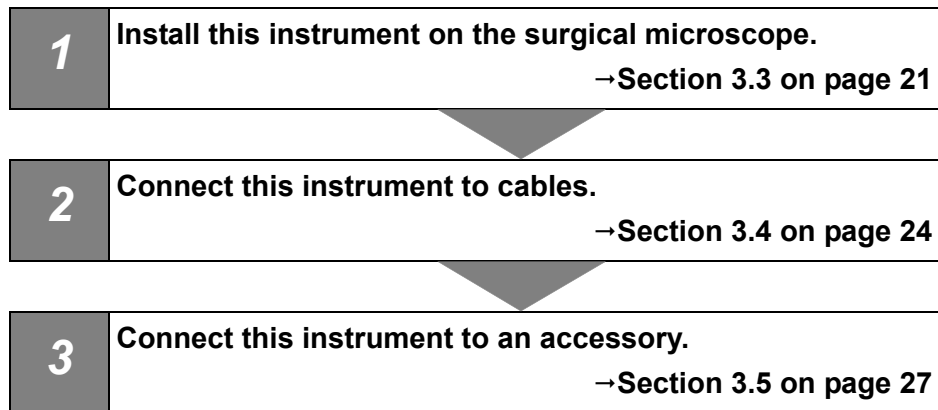
Ch.3

CAUTION

- Be sure to turn the connected surgical microscope and the ancillary equipment OFF before proceeding to the connection work. Otherwise, equipment failure or malfunction may result.
- Use appropriate cables only. Otherwise, equipment damage or malfunction may result.
- Connect every cable correctly and perfectly. If a connector has a lock or click position, connect it securely until the lock is engaged or a click feeling is obtained. Using the equipment with incomplete connection may result in equipment damage as well as malfunction.
- The cables should not be sharply bent, pulled, twisted, or crushed. Cable damage may result.
- Never apply excessive force to connectors. This could damage the connectors.
- Do not block the ventilation grilles of this instrument with a cloth, etc. Otherwise, impossibility of cooling may result in equipment failure or damage.
- Install and connect this instrument on a level surface from which the surgical microscope will not move spontaneously and lock the brake by pushing the brake pedal. If the base moves spontaneously during work, personnel injury may result.
- Do not install this instrument in the proximity of a source of strong electromagnetic waves (microwave therapy equipment, shortwave therapy equipment, MRI, radio, cellphone, etc.). Otherwise, this instrument may fail.

3.2 Connection workflow

The following chart shows the order of installing this instrument on the surgical microscope and attaching the ancillary equipment.



Ch.3

3.3 Installing this instrument

CAUTION

- Hold the carrying handle firmly when transporting this instrument. Otherwise, the instrument may drop and may cause equipment damage.
- Before connecting, unplug the power cord of the surgical microscope from the hospital grade wall mains outlet and do not turn it on. Otherwise, the equipment may be damaged and also the light output from the light guide terminal of this instrument may enter your eye and cause injury.
- Do not hold this instrument by the spare lamp selector lever. Also, do not apply an excessive force to the spare lamp selector lever. Otherwise, equipment damage may result.

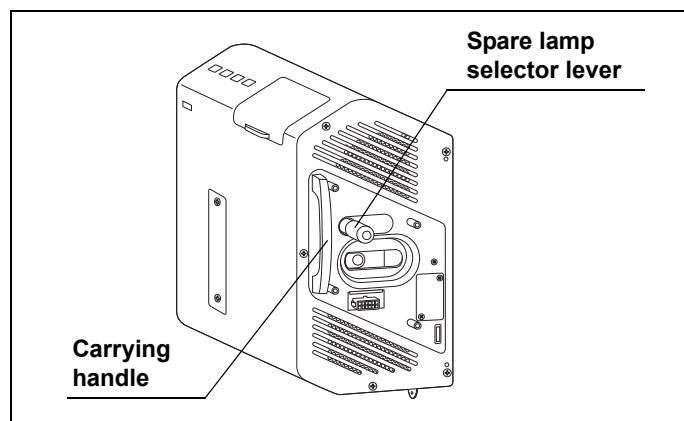


Figure 3.1

- Make sure that this instrument is not connected to the surgical microscope before connecting the foot switch hanger. Otherwise, the foot switch hanger would collide with this instrument and damage it.

Ch.3

3.3 Installing this instrument

- 1 After stopping the surgical microscope, check the position of the brake pedal, push it until it hits the back, apply the brake, and confirm that the surgical microscope is locked to the floor.

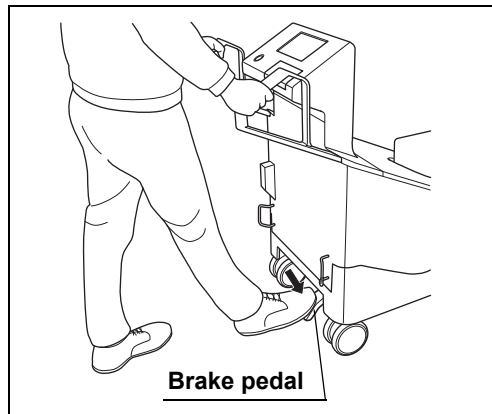


Figure 3.2

CAUTION

After confirming that the surgical microscope is locked to the floor, release your hand from the movement handles. Otherwise, the surgical microscope may move without control and personnel injury may result.

- 2 Hold the carrying handle of this instrument with your right hand and place your left hand on the bottom of this instrument to support it. Then fit the connection hook holes of this instrument on the connection hooks of the surgical microscope to hand this instrument from the microscope.

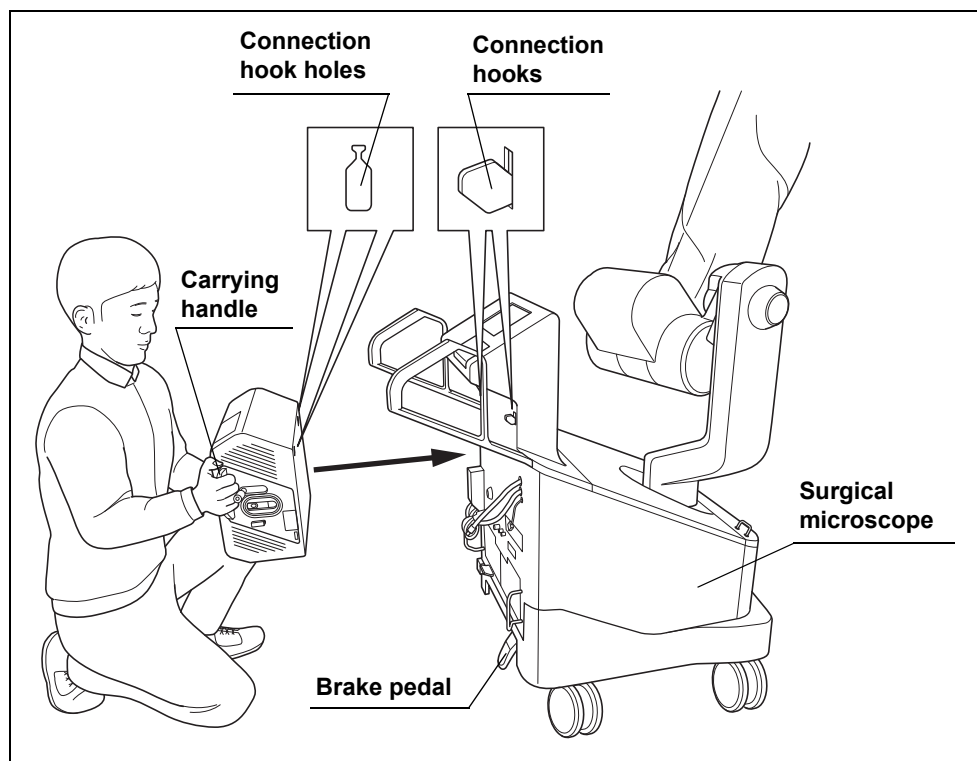


Figure 3.3

CAUTION

- Do not remove your hand from this instrument unless you have confirmed that this instrument is hung securely from the connection hooks of the surgical microscope. Otherwise, this instrument may drop and cause equipment damage.
- Be careful not to have the cable or your hand caught by something when connecting this instrument to the surgical microscope. Otherwise, equipment failure or personnel injury may result.

- 3** Insert the provided lock screws (M5 × 8 mm) (2 pcs.) into the two attaching holes and tighten them using the provided Allen screwdriver (3 mm width across flats, 160 mm axial length) to attach this instrument firmly onto the surgical microscope.

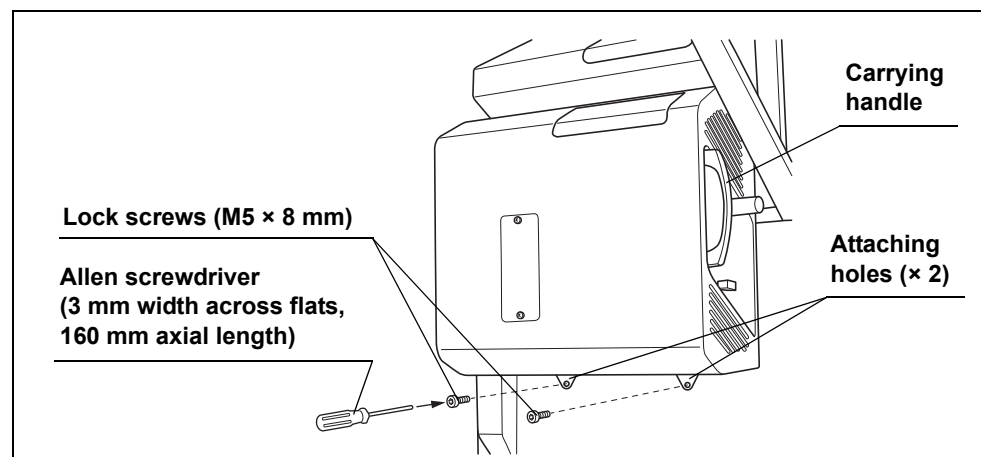


Figure 3.4

CAUTION

- Attach this instrument securely onto the surgical microscope using the provided lock screws (M5 × 8 mm) before use. If they are not attached using the provided lock screws (M5 × 8 mm) or attached using other screws, this instrument may drop and cause equipment damage.
- Always use the provided lock screws (M5 × 8 mm) and provided Allen screwdriver (3 mm width across flats, 160 mm axial length) when attaching this instrument to the surgical microscope. Otherwise, this instrument or the provided lock screws (M5 × 8 mm) may be damaged.

- 4** Apply a light force to the carrying handle of this instrument to confirm that it does not rattle on the surgical microscope.

3.4 Connection of cables

CAUTION

- Do not touch the end surfaces of the light guide cable or leave dirt on them. If an end surface of the cable gets dirty, wipe with a lint-free cloth until the end surface becomes free of dirt. If the cable with a dirty extremity is used, the light guide cable may be damaged.
- Do not connect the cables of the surgical microscope in an entangled or intersected way. Otherwise, an excessive force applied to the connector may disconnect the cable during operation, the force applied to the cable may cause wire disconnection or the cables may hinder the switching to the spare lamp.
- Do not apply an excessive force to the cables and terminals. Otherwise, equipment damage may result.

Ch.3

- 1 Arrange the cables of the surgical microscope in order of the light guide cable, power cable and communication cable from the top to the bottom, so that they are not entangled.

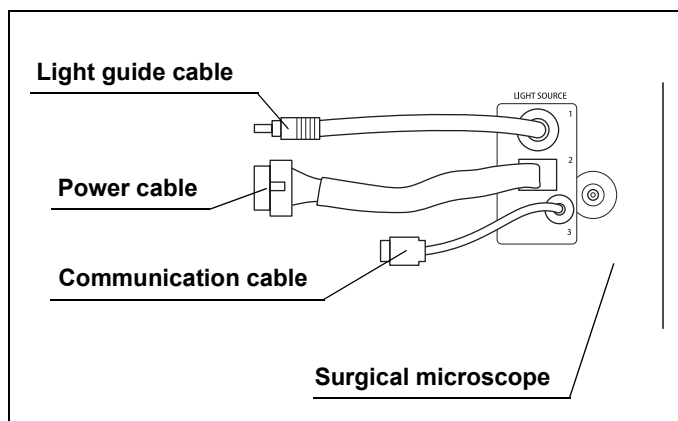


Figure 3.5

- 2 Remove the protective cap from the extremity of the light guide cable and insert the cable all the way until it clicks into the light guide terminal of this instrument.

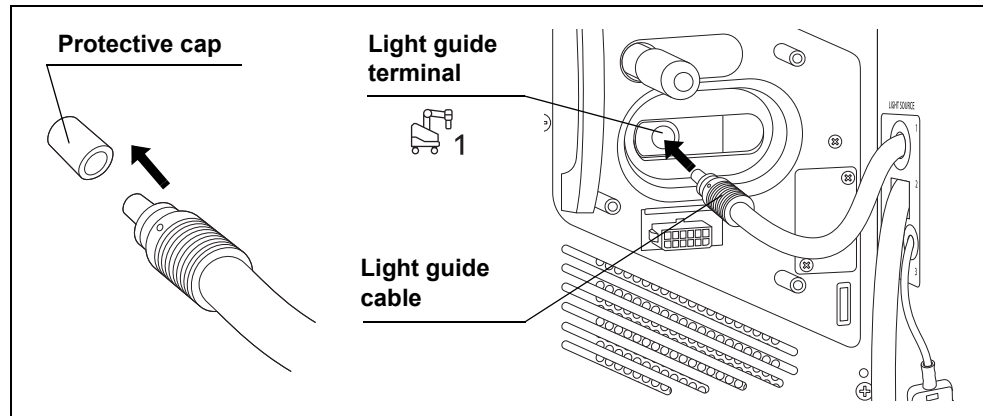


Figure 3.6

NOTE

- If the protective cap is not removed from the extremity of the light guide cable, the cable cannot be connected to the LED light source.
- Be sure to retain the protective cap. It will be reused to protect the extremity of the light guide cable when you shall send this instrument for repair and you detach this instrument from the surgical microscope.

Ch.3

- 3 Insert the communication cable into the communication terminal of this instrument so that the “△” marking comes on the near side and push in all the way until it clicks.

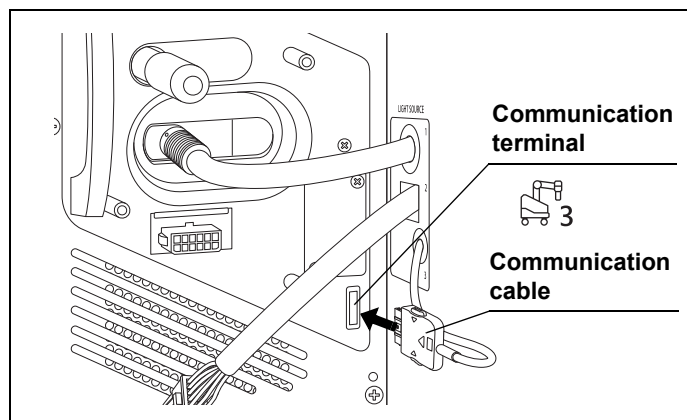


Figure 3.7

3.4 Connection of cables

- 4 Hold the power cable so that the tab comes on the top and insert it into the power supply terminal of this instrument all the way until it clicks.

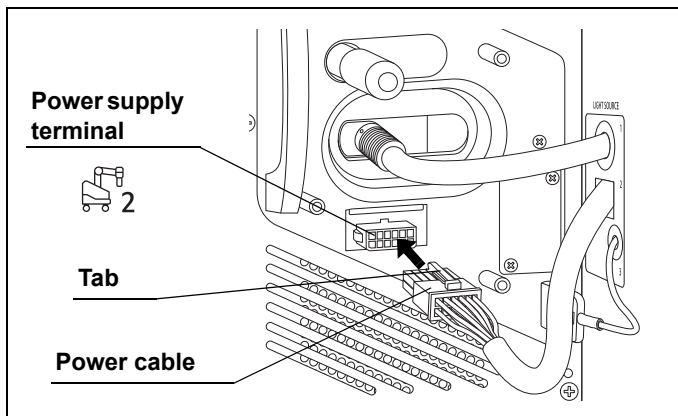


Figure 3.8

- 5 Confirm that none of the cables are intersected. (See Figure 3.9)
- 6 Operate the spare lamp selector lever to confirm that it can be moved smoothly to both ends.

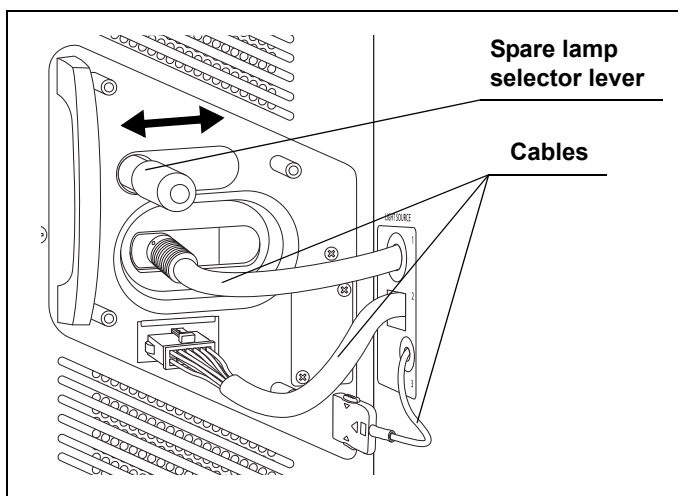


Figure 3.9

3.5 Connection of cable cover

CAUTION

- Always use this instrument with the provided cable cover attached. Otherwise, disconnection or damage of a cable may result. Also, the light guide cable becomes hot during use and causes burns to the person who touches the extremity of the cable.
- When attaching the cable cover to this instrument, be careful not to have the cable caught by the cover. Otherwise, equipment damage may result.
- When attaching the cable cover to this instrument, always be sure to use the provided lock screws (M4 × 10 mm) and Allen screwdriver (3 mm width across flats, 160 mm axial length). Otherwise, equipment, the cable cover, or the provided lock screws (M4 × 10 mm) may be damaged.

Ch.3

- 1 Attach the cable cover on the right side of this instrument taking care not to catch a cable in between. Attach in a way that the spare lamp selector lever protrudes from the hole on the cable cover.
- 2 Insert the provided lock screws (M4 × 10 mm) into the attaching holes on the cable cover and attach the cable cover securely on this instrument using the provided Allen screwdriver (3 mm width across flats, 160 mm axial length).

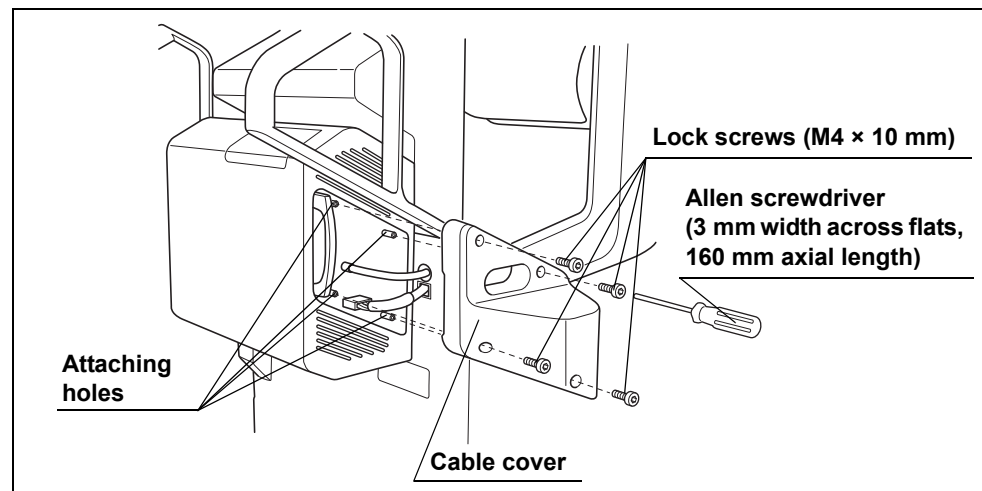


Figure 3.10

3.5 Connection of cable cover

NOTE

Make sure not to lose the provided Allen screwdriver (3 mm width across flats 160 mm axial length). It will be required when detaching this instrument and accessories from the surgical microscope for servicing, etc.

- 3 Operate the spare lamp selector lever to confirm that it can be moved smoothly to both ends.

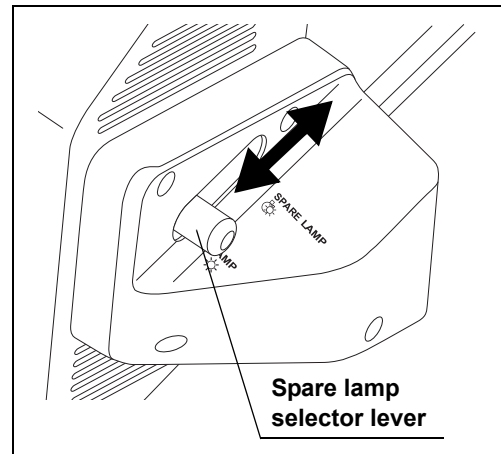


Figure 3.11

Chapter 4 Inspection

Prepare this instrument and other ancillary equipment before each particular case. Refer to the instruction manuals for each piece of equipment.

4.1 Precautions of workflow

WARNING

- Before inspection, be sure to read Chapter 3, “Installation and Connection” and prepare the ancillary equipment optimally. Otherwise, cause patient or operator injury may result as well as malfunctions of the equipment.
- Before use, be sure to inspect this instrument as instructed below. Inspect other ancillary equipment to be used with this instrument as instructed in their respective instruction manuals. If any irregularities are suspected after inspection, do not use the equipment and follow the instructions given in Chapter 7, “Troubleshooting”. If the trouble still persists after troubleshooting, contact Olympus. Using this instrument while irregularities are suspected does not result only in malfunction but there are also the risks of operator and patient injury.

CAUTION

- The illumination lamp lights automatically when this instrument and surgical microscope are turned ON. Do not look directly at the illumination lens of the surgical microscope while the illumination light is output from it. Also, do not point the illumination lens to others. Otherwise, an eye injury may result.
- Always set the power switch of this instrument to “⊙ (ON)” before turning the surgical microscope ON. If this instrument is turned ON after the surgical microscope, malfunction may result.
Keep the power switch of this instrument permanently in the ON position except when necessary.

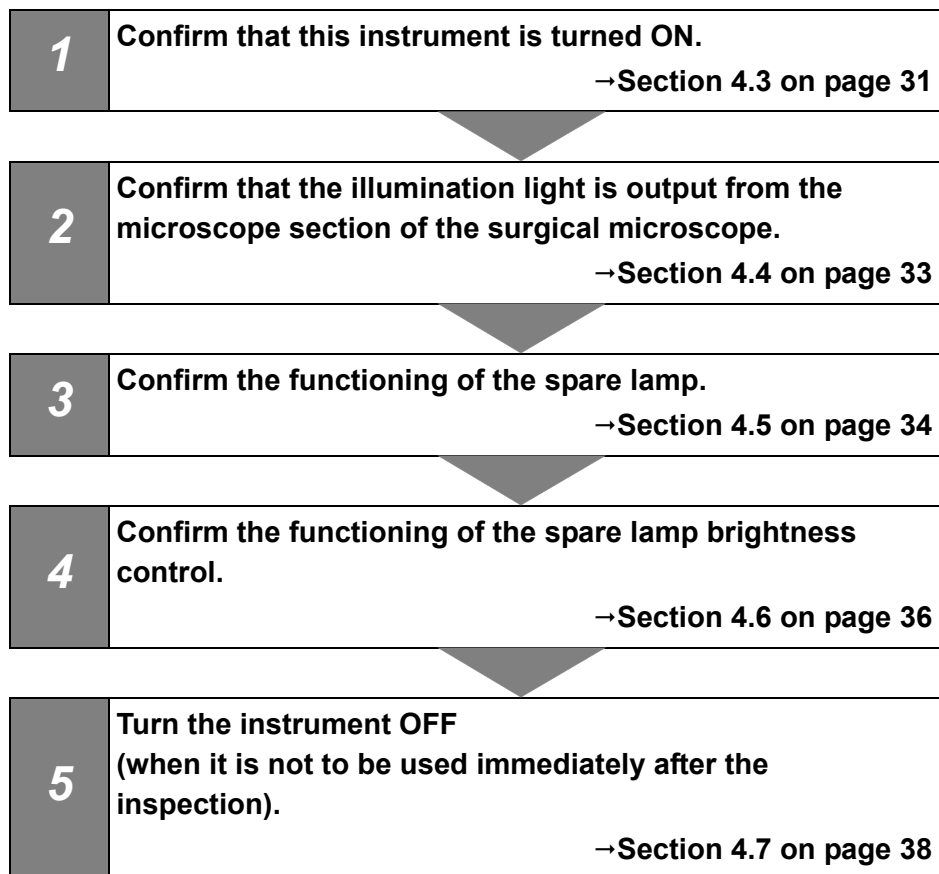
NOTE

A clicking noise may be produced from inside this instrument when it is turned ON. This sound indicates that the setup is executed and does not mean malfunction.

Ch.4

4.2 Inspection workflow

Refer to the inspection workflow below. Follow each step of the workflow for inspection of this instrument before use.



4.3 Inspection of power ON

Use the following steps to check the ventilation grilles and confirm that this instrument can be turned ON.

- 1 Confirm that the spare lamp selector lever is set to "LAMP".
If the spare lamp selector lever is not set correctly in the "LAMP" position, the main lamp will not light up.

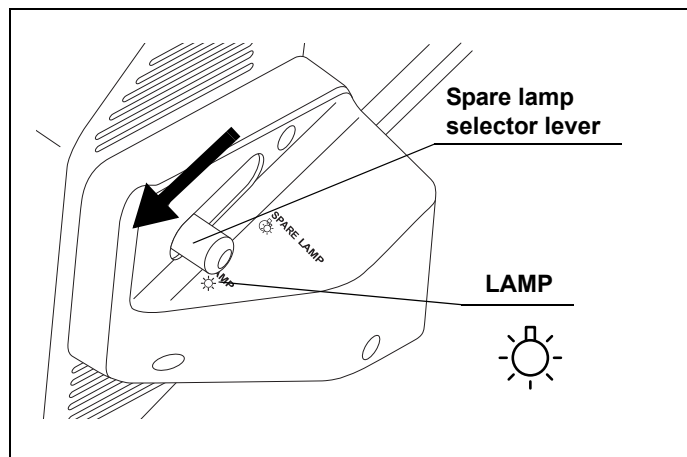


Figure 4.1

- 2 Confirm that the ventilation grilles on the side and bottom panels of this instrument are not stopped by dust, foreign objects, or cloth.

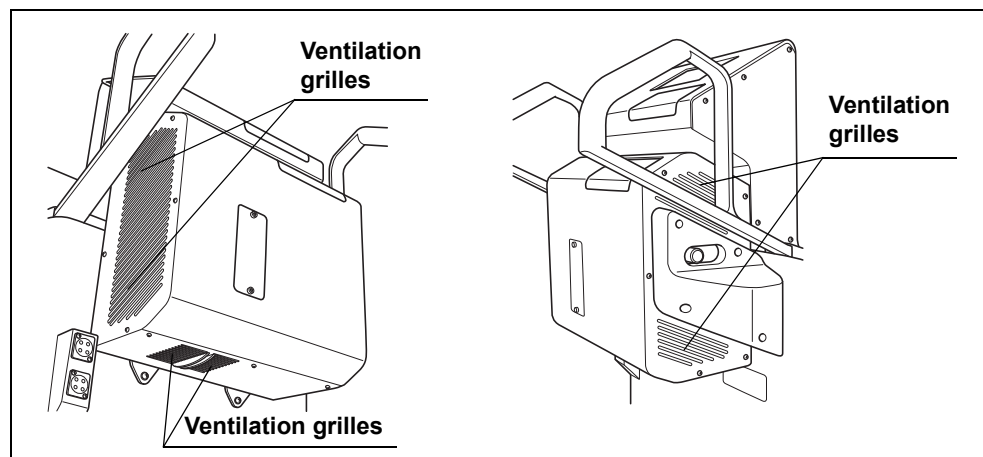


Figure 4.2

4.3 Inspection of power ON

- 3 Confirm that the power switch is set to “⊙ (ON)”. If the power switch is not set to “⊙ (ON)”, open the slide cover of this instrument, set the power switch to “⊙ (ON)” and close the slide cover.

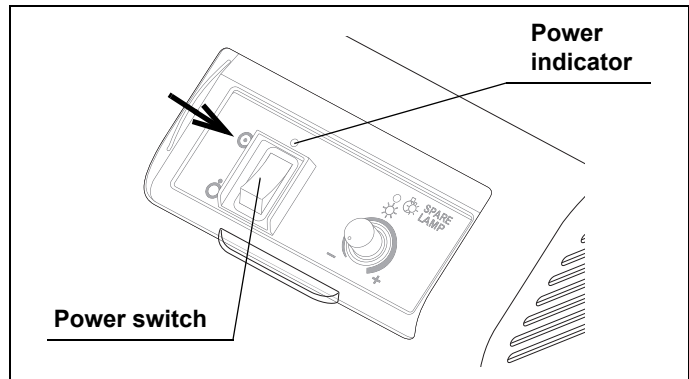


Figure 4.3

- 4 Turn ON the surgical microscope used in combination with this instrument by referring to its instruction manual. This turns this instrument ON and lights up the illumination lamp. Now confirm that the power indicator of this instrument lights green. (See Figure 4.3)

Ch.4

NOTE

The spare lamp lighting indicator lights momentarily when this instrument is turned ON. This is not malfunction.

- 5 Confirm that no error is displayed on the observation monitor screen or the touch panel of the surgical microscope.

4.4 Inspection of illumination light

- 1 Confirm that the illumination light is emitted from the illumination lens of the surgical microscope.

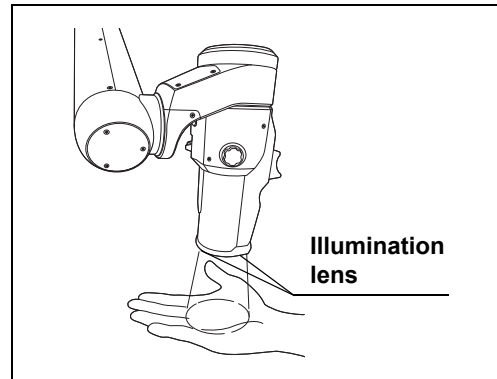


Figure 4.4

- 2 Referring to the instruction manual for the surgical microscope, tap and hold the “Lamp” button on the touch panel of the surgical microscope for about a second and confirm that the illumination lamp is extinguished.

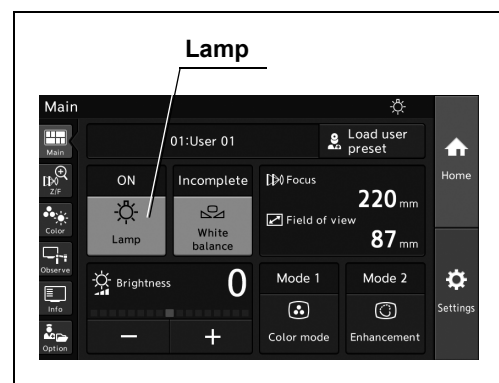


Figure 4.5

- 3 Referring to the instruction manual for the surgical microscope, tap the “Lamp” button on the touch panel of the surgical microscope and confirm that the illumination lamp lights up.
- 4 Confirm that no error is displayed on the observation monitor or touch panel of the surgical microscope.

4.5 Inspection of spare lamp function

Use the following steps to confirm that the spare lamp functions normally.

CAUTION

Be careful not to place the spare lamp selector lever in an intermediate position. Otherwise, lack of illumination may result.

NOTE

- The illumination light is extinguished during operation of the spare lamp selector lever. This is not malfunction.
- The noise of the cooling fan inside this instrument increases when the spare lamp is lit. This is not malfunction.

- 1 Set the spare lamp selector lever to "SPARE LAMP".

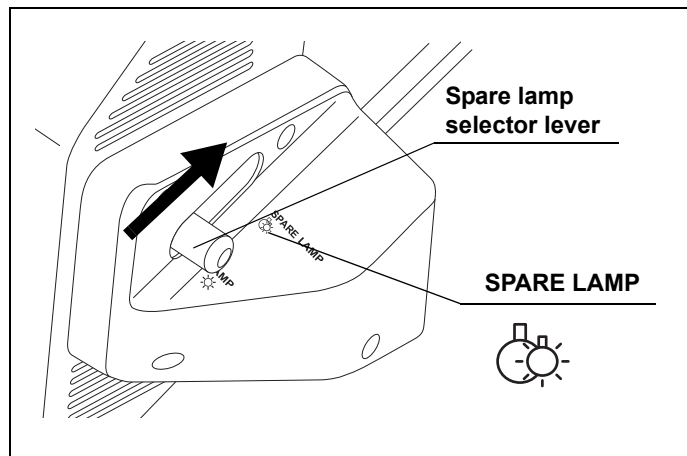


Figure 4.6

- 2 Confirm that the illumination light is emitted from the illumination lens of the surgical microscope.

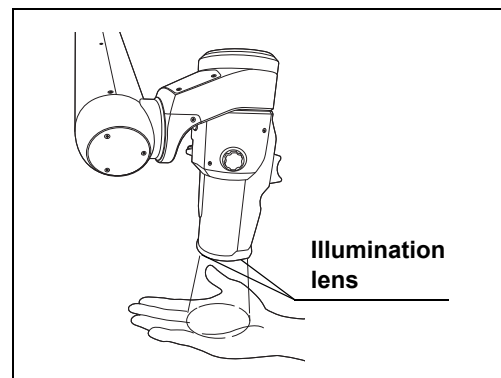


Figure 4.7

- 3 Confirm that the spare lamp lighting indicator on the control panel is lit amber.

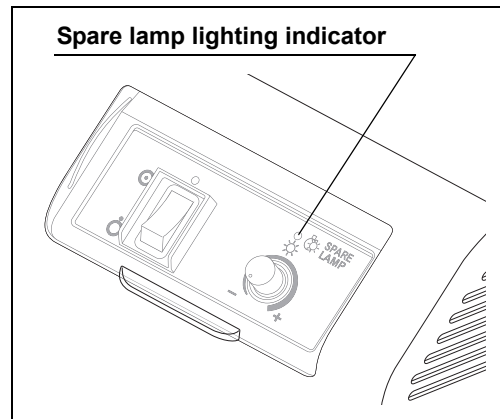


Figure 4.8

NOTE

When the spare lamp is lit, "Spare lamp ON" is displayed on the observation monitor screen.

- 4 Confirm that no error is displayed on the observation monitor or the touch panel of the surgical microscope.

4.6 Inspection of spare lamp brightness control

Use the following steps to confirm that the brightness of the spare lamp is controllable.

NOTE

The spare lamp brightness control knob functions only when the spare lamp is lit.

- 1 Open the slide cover upward and rotate the spare lamp brightness control knob on the control panel.

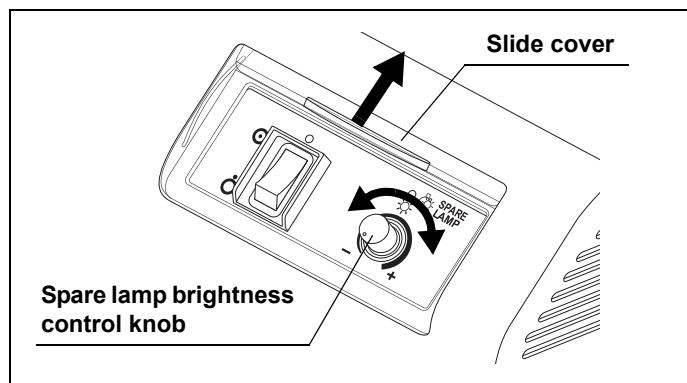


Figure 4.9

- 2 Confirm that the brightness of the illumination lamp emitted from the illumination lens of the operation lamp is variable in response to the rotation of the spare lamp brightness control knob.

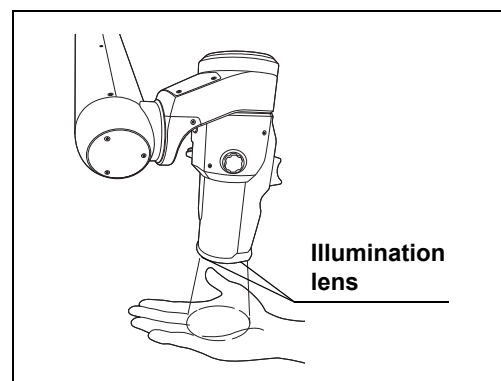


Figure 4.10

- 3 Set the spare lamp selector lever back to "LAMP".

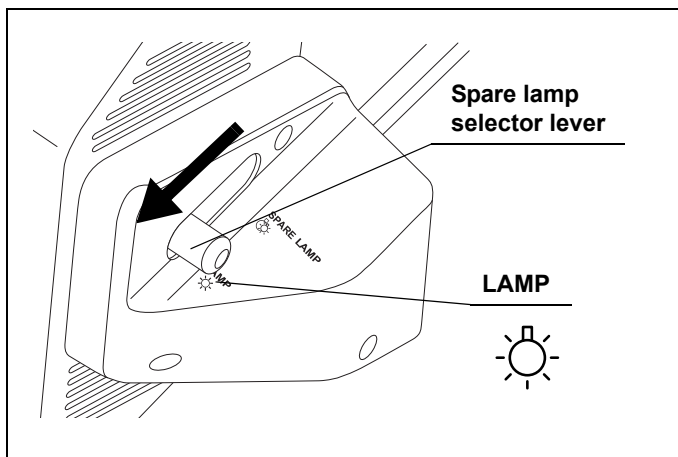


Figure 4.11

- 4 Close the slide cover.

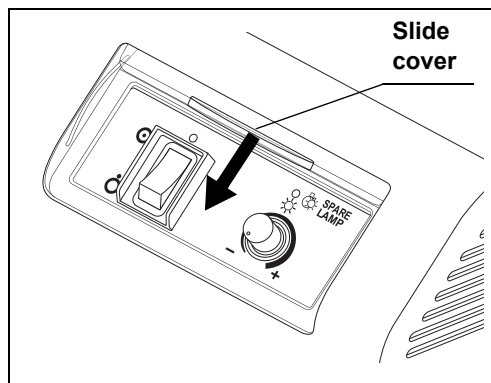


Figure 4.12

4.7 Power OFF

- 1 Referring to the instruction manual for the surgical microscope, turn OFF the surgical microscope by pressing the power switch.

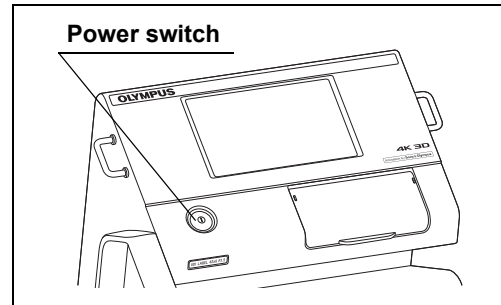


Figure 4.13

NOTE

Turning the surgical microscope OFF shuts down the power supply to this instrument. Therefore, it is recommended that the power switch of this instrument is kept permanently in the “⊙ (ON)” position.

Ch.4

- 2 Confirm that the power indicator on the control panel of this instrument is extinguished.

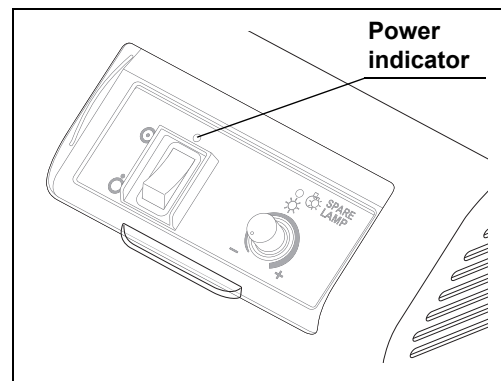


Figure 4.14

Chapter 5 Operation

The operator of this instrument must be a physician or medical personnel under the supervision of a physician and must have received sufficient training in clinical procedures of microsurgery using surgical microscopes. This manual, therefore, does not explain or discuss the details of microsurgery using surgical microscopes. This chapter therefore pertains only to the basic operating procedures and basic warnings and cautions to be used in the operation.

5.1 Precautions for operation

WARNING

- Always wear appropriate protection gear. Otherwise, contact with hazardous substances such as chemicals and infective matters such as blood and mucus of the patient may cause health damage to the operator and/or assistant.
- If any irregularity is suspected during use, immediately stop using the equipment and take proper measures by referring to Chapter 7, "Troubleshooting" as well as the instruction manuals of the ancillary equipment used in combination with this instrument. If this instrument continues to be used while an irregularity is suspected, damage to the patient's health may result.

CAUTION

- The illumination lamp lights automatically when this instrument and surgical microscope are turned ON. Do not look directly at the illumination lens of the surgical microscope while the illumination light is output from it. Also, do not point the illumination lens to others. Otherwise, an eye injury may result.
- When the illumination is not required, press the lamp button of the surgical microscope to extinguish the lamp. If the illumination lamp is left lighted, the illumination light irradiation on a position other than the observed region may cause burns to the operator or patient.
- Combination with other equipment
 - Do not install this instrument in the proximity of a source of strong electromagnetic waves (microwave therapy equipment, shortwave therapy equipment, MRI, radio, cellphone, etc.). Otherwise, this instrument may fail.
 - When using an electrosurgical power unit in combination with this instrument, confirm that the high-frequency noise is at a level that does not affect the operation of this instrument in advance. Otherwise, malfunction may result.

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5.2 Turning the instrument and illumination lamp ON

CAUTION

- Do not approach a cord connected to the electrosurgical unit to this instrument and the ancillary equipment combined with it. Otherwise, malfunction may be caused during the high-frequency output.
- A spray-type lubricant, anesthetic, alcohol or other chemical liquid should be used at a distance from this instrument so that it is not spilt on this instrument. Otherwise, the chemical entering this instrument through a ventilation grille may cause equipment failure.

5.2 *Turning the instrument and illumination lamp ON*

CAUTION

Always set the power switch of the LED light source to “ (ON)” before turning the surgical microscope ON. If the LED light source is turned ON after the surgical microscope, malfunction may result.

- 1 Confirm that the spare lamp selector lever is set to “LAMP” (see Figure 5.1) and that the power switch of this instrument is set to “⊙ (ON)”. (See Figure 5.2)

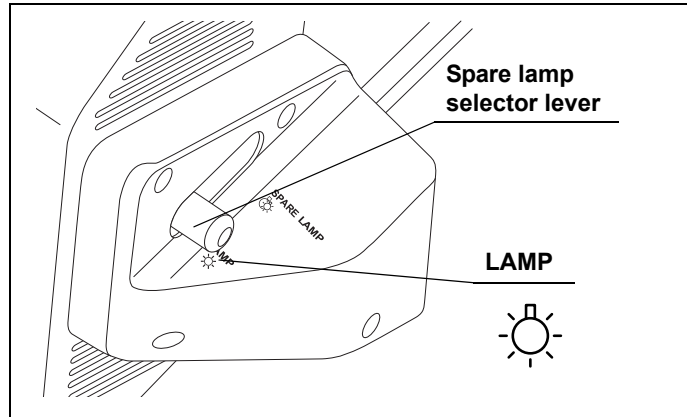


Figure 5.1

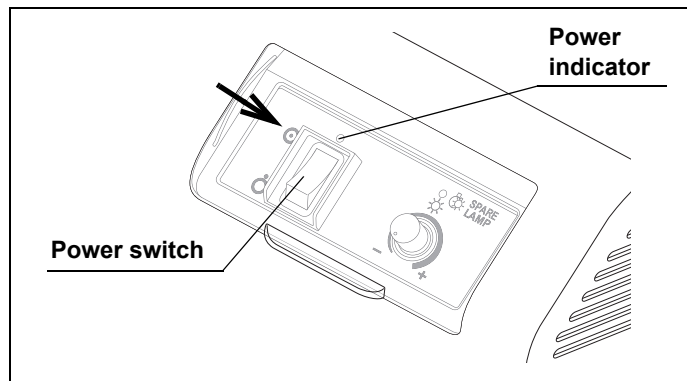


Figure 5.2

- 2 Referring to the instruction manual for the surgical microscope, turn it ON (see Figure 5.3). This instrument is turned ON and the illumination lamp is lit. In addition, the power indicator of this instrument lights up green. (See Figure 5.2)

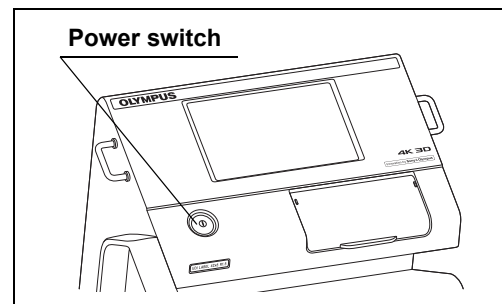


Figure 5.3

- 3 Operate the surgical microscope by referring to the instruction manual for the surgical microscope.

5.3 Extinction of illumination lamp

- 1 Tap and hold the “Lamp” button on the touch panel of the surgical microscope for about a second. The illumination lamp should be turned OFF.

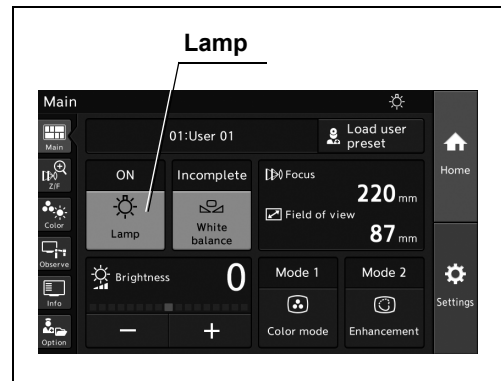


Figure 5.4

NOTE

For how to control the touch panel of the surgical microscope, refer to the instruction manual for the surgical microscope.

- 2 To light the illumination lamp again, tap the lamp button on the touch panel of the surgical microscope.

5.4 Power OFF

- 1 Referring to the instruction manual for the surgical microscope, press the power switch of the surgical microscope to turn it OFF.

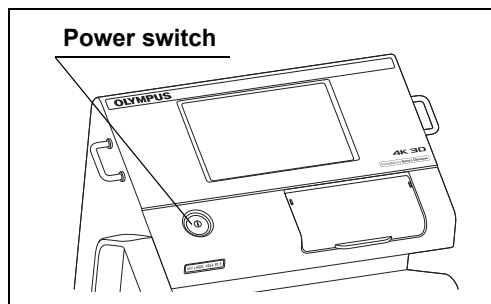



Figure 5.5

NOTE

Turning the surgical microscope OFF shuts down the power supply to this instrument. Therefore, it is recommended that the power switch of this instrument is kept permanently in the “ (ON)” position.

- 2 Confirm that the power indicator on the control panel of this instrument is turned off.

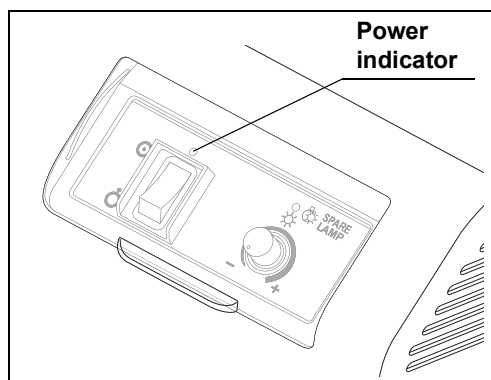


Figure 5.6

| 5.4 Power OFF

Ch.5

Chapter 6 Care, Storage, and Disposal

6.1 Care

WARNING

- When cleaning this instrument, 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 this instrument could pose an infection control risk.
- Do not apply spray-type medical agents such as rubbing alcohol directly to this instrument. Medical agents may enter the equipment through the ventilation grills and may cause equipment damage.

CAUTION

- After wiping with a piece of lint-free cloth moistened with neutral detergent, dry the instrument thoroughly before using it again. Using the instrument while it is wet may cause equipment damage.
- Do not attempt to clean any electrical connection part (such as a connector or contact) of power, video cables, and light guide terminal using moistened lint-free cloth. Otherwise, damage or corrosion may cause equipment failure.
- Do not soak in water, autoclave, or gas sterilize this instrument and ancillary equipment. These methods will damage it.
- Clean and vacuum dust from the ventilation grills using a vacuum cleaner, when necessary. Otherwise, this instrument and ancillary equipment may break down and damage may occur due to overheating.
- If bioburden or infectious debris enters an area of the instrument that cannot be cleaned, such as an opening, do not use the instrument and contact Olympus.

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6.2 Storage

After using this instrument and ancillary equipment, immediately perform the following cleaning procedures. If cleaning is delayed, residual organic debris will begin to dry, and it may be difficult to effectively clean this instrument and ancillary equipment. Always remove debris immediately after every use.

- 1** Turn the surgical microscope OFF and disconnect the power cord from the hospital grade wall mains outlet.
- 2** When this instrument and ancillary equipment are soiled with blood or other potentially infectious materials, wipe off all debris using a piece of lint-free cloth moistened with neutral detergent.
- 3** Remove dust, dirt, and other stains on the surface by wiping with a piece of lint-free cloth moistened with 70% ethyl or 70% isopropyl alcohol.
- 4** Make sure to dry this instrument and ancillary equipment after wiping with 70% ethyl or 70% isopropyl alcohol.

6.2 Storage

When this instrument is not to be used for a certain period, store it as instructed below. Be sure to perform the operation instructed in Section 6.1, "Care" before storing this instrument.

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CAUTION

Do not store this instrument unit 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 this instrument may result.

Perform storage of the instrument by referring to the instruction manual for the surgical microscope.

6.3 Disposal

- 1** Perform the maintenance operation as instructed in Section 6.1, "Care".
- 2** Dispose of this instrument and/or accessories by observing your national and local laws and guidelines.

Chapter 7 Troubleshooting

7.1 Troubleshooting

If this instrument is clearly found to have failed during the inspection described in Chapter 4, “Inspection” or during use in following Chapter 5, “Operation”, do not use the instrument and take proper measures by referring to Section 7.2, “Troubleshooting guide”. If the problem still persists, have the instrument repaired by referring to Section 7.4, “Returning this instrument for repair”.

WARNING

Never use this instrument if any irregularity is suspected. Otherwise, patient and operator injury may result as well as malfunction.

NOTE

If an accessory of this instrument needs to be replaced, contact Olympus.

7.2 Troubleshooting guide

The following table shows the possible causes of and countermeasures against troubles that may occur due to equipment setting errors or deterioration of consumables. If the irregularity cannot be solved after checking the following table, have this instrument repaired by following Section 7.4, "Returning this instrument for repair".

Irregularity description	Possible cause	Solution
Power cannot be turned ON.	Power switch of the surgical microscope is not set to ON.	Set the power switch to ON by referring to the instruction manual for the surgical microscope.
	The power cord of the surgical microscope is not connected.	Connect the power cord by referring to the instruction manual for the surgical microscope.
	The power cable is not connected to this instrument.	Connect the power cable to this instrument by referring to Section 3.4, "Connection of cables".
	The power switch of this instrument is not set to ON.	Set the power switch to ON by referring to Section 5.2, "Turning the instrument and illumination lamp ON".
Illumination lamp does not light.	The light guide cable is not connected to this instrument.	Connect the light guide cable to this instrument by referring to Section 3.4, "Connection of cables".
	The illumination lamp ON/OFF switch of the surgical microscope is set to OFF.	Turn the illumination lamp on by referring to the instruction manual for the surgical microscope.
	The spare lamp selector lever is in a position other than "LAMP" or "SPARE LAMP".	Set the spare lamp selector lever to the "LAMP" or "SPARE LAMP" position.
Image (illumination) is too dark or bright.	The communication cable is not connected to this instrument.	Connect the communication cable to this instrument by referring to Section 3.4, "Connection of cables".
	The light guide cable is half unplugged from the light guide terminal.	Connect the light guide cable all the way into this instrument by referring to Section 3.4, "Connection of cables".
	The spare lamp selector lever is set to "SPARE LAMP".	Set the spare lamp selector lever to "LAMP".
	The brightness control with the spare lamp brightness control knob is inappropriate.	Adjust the control knob to obtain optimum brightness.
Brightness cannot be controlled with the spare lamp brightness control knob.	The spare lamp selector lever is in a position other than "SPARE LAMP".	Set the spare lamp selector lever to the "SPARE LAMP" position.
The spare lamp lighting indicator is lit unintentionally.	The spare lamp selector lever is set to "SPARE LAMP".	Set the spare lamp selector lever to "LAMP".

○ Measure to be taken when an error code is displayed on the monitor or the touch panel of the surgical microscope

When an error code is displayed, some functions may not be available. If a code other than the error codes listed below is displayed, take an optimum measure by referring to the instruction manual for the equipment used in combination with this instrument. If an optimum measure cannot be taken, contact Olympus.

Code	Error message	Possible cause	Solution
E101 E102	Temperature error	The temperature of the LED light source exceeded the permitted limit.	The main lamp of this instrument is unavailable. Put the surgical microscope to the WLI mode and set the spare lamp selector lever of this instrument to "SPARE LAMP". Turn the surgical microscope and this instrument OFF and contact Olympus.
E105 E106 E107 E109 E110 E111 E113 E127	Light source error	Irregularity in the LED light source.	The main lamp of this instrument is unavailable. Put the surgical microscope to the WLI mode and set the spare lamp selector lever of this instrument to "SPARE LAMP". After use, turn the surgical microscope and this instrument OFF and contact Olympus.
E108 E112	Light source error	Irregularity in the LED light source.	The main lamp of this instrument is unavailable. Set the spare lamp selector lever of this instrument to "SPARE LAMP". After use, turn the surgical microscope and this instrument OFF and contact Olympus.
E124 E125	Temperature error	The temperature of the LED light source exceeded the permitted limit.	The spare lamp of this instrument is unavailable. If this error occurred during use of the main lamp, contact Olympus after use. If this error occurred during use of the spare lamp, immediately stop the use, turn this instrument OFF, and contact Olympus.
E126	Light source error	Irregularity in the LED light source.	The spare lamp of this instrument is unavailable. After use, turn the surgical microscope and this instrument OFF and contact Olympus.
E208 E209 E210 E211	Temperature error	The temperature of the LED light source exceeded the permitted limit.	Put the surgical microscope to the WLI mode. After use, turn the surgical microscope and this instrument OFF and contact Olympus.
E212 E213 E214 E215 E216 E217	Light source error	Irregularity in the LED light source.	Put the surgical microscope to the WLI mode. After use, turn the surgical microscope and this instrument OFF and contact Olympus.

7.2 Troubleshooting guide

Code	Error message	Possible cause	Solution
E218	Light source error	Irregularity in the LED light source.	Put the surgical microscope to the WLI mode. If this error occurs frequently, set the spare lamp selector lever of this instrument to "SPARE LAMP" and, after use, turn the surgical microscope and this instrument OFF, and contact Olympus.
E227 E228 E229 E237	Light source error	Irregularity in the LED light source.	After use, turn the surgical microscope and this instrument OFF and contact Olympus.
E230	Light source unconnected error	Irregularity in communication between the surgical microscope and LED light source.	Put the surgical microscope to the WLI mode. Turn this instrument and the surgical microscope OFF. Remove the cable cover from this instrument, confirm that the communication cable is not unplugged or otherwise irregular, and turn this instrument ON again. If the error still occurs, turn the surgical microscope and this instrument OFF after use and contact Olympus.
E306 E307 E308 E309	Light source fan error	Irregularity in the fan of the LED light source.	Turn this instrument OFF, confirm that the ventilation grilles are not stopped or obstructed by a foreign object, and turn this instrument ON again. If the error still occurs, turn the surgical microscope and this instrument OFF after use and contact Olympus.
E310 E311 E312 E313	Temperature error	The temperature of the LED light source exceeded the permitted limit.	Turn this instrument OFF, confirm that the ventilation grilles are not stopped or obstructed by a foreign object, and turn this instrument ON again. If the error still occurs, turn the surgical microscope and this instrument OFF after use and contact Olympus.
E339 E340	Microscope error, Light source error	Irregularity in the surgical microscope.	Put the surgical microscope to the WLI mode. After use, turn the surgical microscope and this instrument OFF and contact Olympus.

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7.3 Remedial actions in case of emergency

Should the main lamp fail, use the spare lamp by using the following steps.

■ Lighting of spare lamp

Should the main lamp fail, light the spare lamp by using the following steps.

CAUTION

- The spare lamp is used only when the main lamp fails. As the spare lamp is designed for the emergency in case the main lamp fails, it is given only the minimum required level of brightness.
- Be careful not to place the spare lamp selector lever in an intermediate position. Otherwise, lack of illumination may result.

NOTE

- The illumination light is extinguished during operation of the spare lamp selector lever. This is not malfunction.
- The noise of the cooling fan inside this instrument increases when the spare lamp is lit. This is not malfunction.

- 1 Set the spare lamp selector lever to "SPARE LAMP".

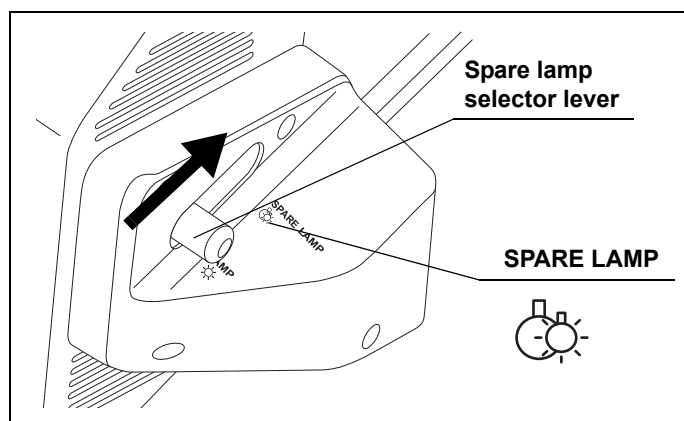


Figure 7.1

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7.3 Remedial actions in case of emergency

- 2 The spare lamp lights up and the spare lamp lighting indicator on the control panel lights amber

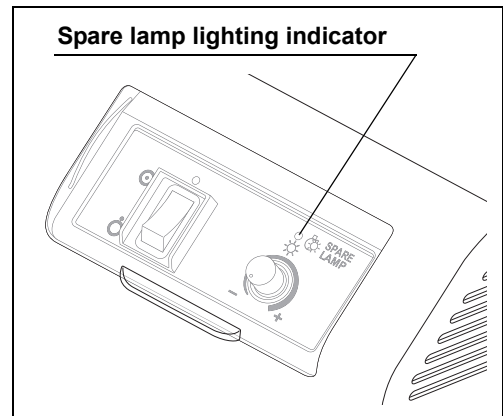


Figure 7.2

Control of spare lamp brightness

WARNING

The spare lamp brightness is not adjusted automatically. Adjust the brightness always at an optimum level by controlling the spare lamp brightness control knob. The illumination light has a potential of exerting unfavorable effects on the living tissue.

Open the slide cover upward and rotate the spare lamp brightness control knob on the control panel to adjust the brightness.

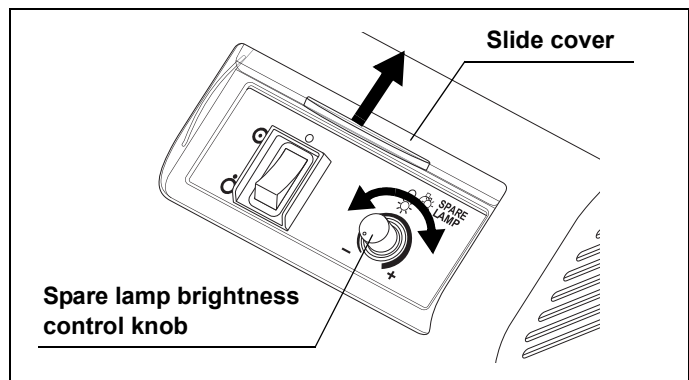


Figure 7.3

■ Extinction of spare lamp

The spare lamp is an emergency device provided for use in case of failure of the main lamp, and is lit automatically when the spare lamp selector lever is switched. It cannot be turned on or off from the touch panel of the surgical microscope. Use the following steps when it becomes necessary to turn off the illumination light during use of the spare lamp.

CAUTION

In case there is any irregularity, do not set the spare lamp selector lever back to "LAMP". Because an irregularity has already occurred, normal functioning cannot be expected.

- 1 If you are currently using this instrument by setting the spare lamp selector lever to "SPARE LAMP", open the slide cover upward and set the power switch to "⊖ (OFF)". The spare lamp extinguishes.

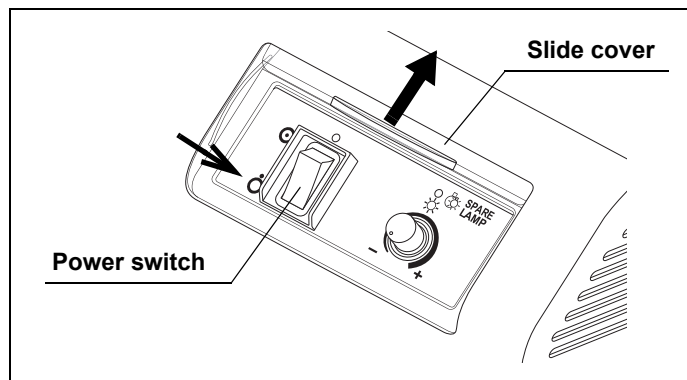


Figure 7.4

NOTE

When turning off the LED light source device to turn off the spare lamp [E230] will be generated.

Ch.7

- 2 To light the spare lamp again, set the power switch to "⊕ (ON)". The spare lamp lights up.

7.4 *Returning this instrument for repair*

When returning this instrument for repair, contact Olympus. With this instrument, 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 because of repairs attempted by non-Olympus personnel.

Appendix

Combination equipment

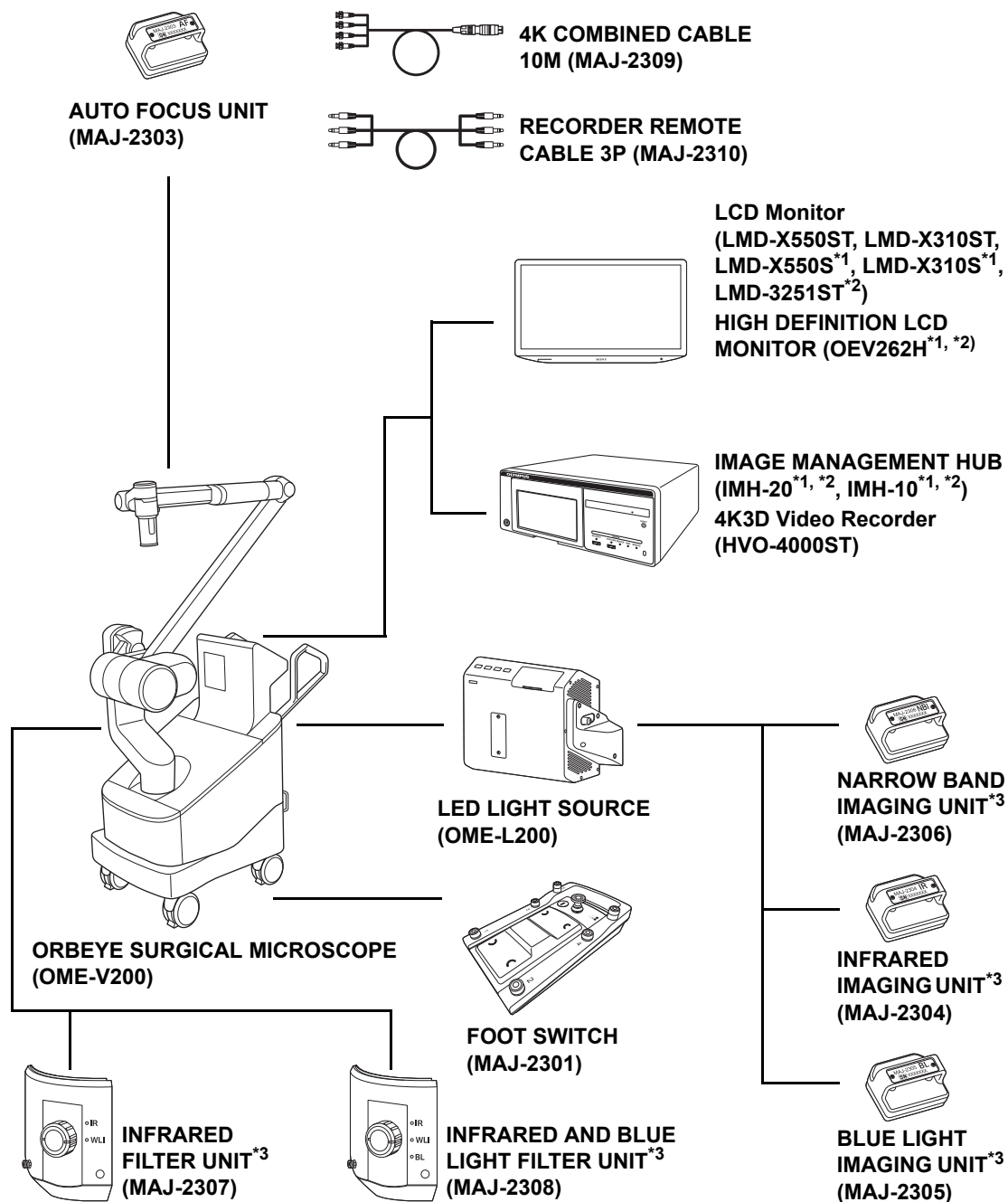
■ System chart

The recommended combinations of equipment that can be used with this instrument are listed next page. New products released after the introduction of this instrument may also be compatible for use in combination with it. For further details, contact Olympus.

WARNING

Be sure to use the equipment in one of the recommended combinations. If combinations of equipment other than those shown below are used, the full responsibility should be assumed by the medical treatment facility. Such combinations do not only allow the equipment to manifest their full functionality but may also imperil the safety of the patient and medical personnel. In addition, the endurance of this instrument and ancillary equipment is not guaranteed. Troubles caused in this case are not covered by free-of-charge repair.

App.



App.

*1 3D incompatible.

*2 4K incompatible.

*3 These products may not be available in some areas.




Specifications

■ Environments

Operating environment	Ambient temperature	10 – 35°C (50 – 95°F)
	Relative humidity	30 – 75% (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 – 95% (without condensation)
	Atmospheric pressure	700 – 1060 hPa (0.7 – 1.1 kgf/cm ²) (10.2 – 15.4 psia)
Transportation environment (conditions during transportation and short-term storage)	Ambient temperature	–20 to 70°C (–4 to 158°F)
	Relative humidity	10 – 95%
	Atmospheric pressure	700 – 1060 hPa (0.7 – 1.1 kgf/cm ²) (10.2 – 15.4 psia)

App.

■ Specifications

Item		Specifications
Power input	Rated current/ Rated voltage	12.3 V – 12 A, 12.5 V – 10 A, DC
Size	Dimensions (standard)	326 (W) × 307 (H) × 175 (D) mm
	Dimensions (maximum)	408 (W) × 333 (H) × 178 (D) mm
	Weight	12 kg
Illumination	Lamp	Main lamp: LED Spare lamp: LED
Medical Devices Directive		 <p>This device complies with the requirements of Directive 93/42/EEC concerning medical devices. Classification: Class I</p>
RoHS Directive		 <p>This device complies with the requirements of Directive 2011/65/EU concerning electrical and electronic equipment.</p>
WEEE Directive		 <p>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.</p> <p>Refer to your local Olympus distributor for return and/or collection systems available in your country.</p>
EMC	Applicable standard	IEC 60601-1-2: 2014 <ul style="list-style-type: none"> Compliant to the EMC requirements for medical equipment edition 4 (IEC 60601-1-2: 2014). Classification by emission standard CISPR 11 Group 1, Class A
Year of manufacture		The last digit of the year of manufacture is the second digit of the serial number. In this example, the year is 2017. Ex. 1701234 (serial number)

App.

EMC information

○ Guidance and manufacturer’s declaration — Electromagnetic emissions

This model is intended for use by medical personnel in hospitals 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.

Emissions test	Compliance	Electromagnetic environment - 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.

App.

○ Guidance and manufacturer's declaration — Electromagnetic immunity

This model is intended for use by medical personnel in hospitals 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.

Immunity test	IEC 60601-1-2 (2014) test level	Compliance level	Electromagnetic environment - Guidance
Electrostatic discharge (ESD) IEC 61000-4-2	Contact: ±8 kV Air: ±2, ±4, ±8, ±15 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	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	Same as left	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions, and voltage variations on power supply input lines IEC 61000-4-11	0% U_T (100% dip in U_T) for 0.5 cycle/1 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.
	70% U_T (30% dip in U_T) for 25 cycle (50 Hz)/ 30 cycle (60 Hz)		
	0% U_T (100% dip in U_T) for 250 cycle (50 Hz)/ 300 cycle (60 Hz)		
	—		
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	30 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.
Definition	U_T is the a.c. mains voltage prior to application of the test level.		

App.

○ Guidance and manufacturer's declaration — Electromagnetic immunity

WARNING

- This model is intended for use by medical personnel in hospitals 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.
- Portable and mobile RF communications equipment should be used no closer than 30 cm (12 inches) to any part of this model, including cables specified by Olympus.

Immunity test	IEC 60601-1-2 (2014) test level	Compliance level	Electromagnetic environment - Guidance
Conducted RF IEC 61000-4-6	3V (150 kHz – 80 MHz)	Same as left	Refer to the guidance in the left column.
	6V (ISM band of 150 kHz – 80 MHz)	Same as left	Refer to the guidance in the left column.
	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		
Radiated RF IEC 61000-4-3	3V/m (80 MHz – 2.7 GHz)	Same as left	Refer to the guidance in the left column.
Proximity magnetic field from RF communication equipment IEC 61000-4-3	Refer to the table of the next page.	Same as left	Refer to the guidance in the left column.

App.

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*2 ±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.

*2 As an alternative to FM modulation, 50% pulse modulation at 18 Hz may be used because while it does not represent actual modulation, it would be worst case.

○ Guidance and manufacturer's declaration — Cables used for EMC compliance testing

This model has passed the EMC compliance testing with the cables below.

Product Name	Description	Cable (Shield)	Length [m]	Location	Classification	Test Included
MAJ-2301	Foot Switch cable	Yes	4.65	Rear panel	SIP/SOP	Emission/Immunity
MAJ-2313	POWER CORD EU	No	4.5	Rear panel	AC	Emission/Immunity
MAJ-2309	4K COMBINED CABLE 10M	Yes	10	Rear panel	SIP/SOP	Emission/Immunity
MAJ-1912	HD-SDI cable 8.5M	Yes	8.5	Rear panel	SIP/SOP	Emission/Immunity
MAJ-2016	3G-SDI cable 8.5M	Yes	8.5	Rear panel	SIP/SOP	Emission/Immunity
MAJ-2310	RECORDER REMOTE CABLE 3P	Yes	10	Rear panel	SIP/SOP	Emission/Immunity

Refer to the instruction manuals for each piece of equipment.

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