OLYMPUS®

OPERATION MANUAL

INSTRUCTIONS

EVIS EXERA

EVIS EXERA BRONCHOVIDEOSCOPE

OLYMPUS BF TYPE **160**
OLYMPUS BF TYPE **P160**
OLYMPUS BF TYPE **1T160**
OLYMPUS BF TYPE **XT160**
OLYMPUS BF TYPE **3C160**

EVIS EXERA BRONCHOFIBERVIDEOSCOPE

OLYMPUS BF TYPE **MP160F**
OLYMPUS BF TYPE **XP160F**

Refer to the endoscope's companion manual, the "REPROCESSING MANUAL" whose cover lists the model of your endoscope for reprocessing information.

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

Contents

Symbols

The meaning(s) of the symbol(s) shown on the package with the components, the back cover of this instruction manual and/or this instrument are as follows:


Refer to instructions.


Endoscope


TYPE BF applied part

Lot number


Do not reuse.

Use by (expiration date)

Sterilization lot number

Sterilized using irradiation


Manufacturer

Authorised representative in the European Community

Important Information — Please Read Before Use

Intended use

These instruments have been designed to be used with an Olympus video system center, light source, documentation equipment, video monitor, endo-therapy accessories (such as biopsy forceps) and other ancillary equipment for endoscopy and endoscopic surgery within the airways and tracheobronchial tree.
Do not use these instruments for any purpose other than their intended uses.

Applicability of endoscopy and endoscopic treatment

If there is an official standard on the applicability of endoscopy and endoscopic treatment that is defined by the medical administration or other official institutions such as academic societies on endoscopy or pulmonology, follow that standard. Before starting endoscopy and endoscopic treatment, thoroughly evaluate its properties, purposes, effects, and possible risk (their natures, 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 the 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 this instrument safely and effectively. Before use, thoroughly review this manual and the manuals of all equipment which will be used during the procedure and use the equipment as instructed.
Note that the complete instruction manual set for this endoscope consists of this manual and the “REPROCESSING MANUAL” whose cover lists the model of your endoscope. It also accompanied the endoscope at shipment.
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.

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 endoscopic technique. This manual, therefore, does not explain or discuss clinical endoscopic procedures. For details on the clinical endoscopic procedures, the physician and operator are requested to form judgments from their viewpoints as specialists.

Instrument compatibility

Refer to the “System chart” in the Appendix to confirm that this instrument is compatible with the ancillary equipment being used. Using incompatible equipment can result in patient or operator injury and/or equipment damage.

Reprocessing before the first use/reprocessing and storage after use

This instrument was not cleaned, disinfected or sterilized before shipment. Before using this instrument for the first time, reprocess it according to the instructions given in the endoscope’s companion manual, the “REPROCESSING MANUAL” whose cover lists the model of your endoscope.

After using this instrument, reprocess and store it according to the instructions given in the endoscope’s companion reprocessing manual. Improper and/or incomplete reprocessing or storage can present an infection control risk, cause equipment damage or reduce performance.

Repair and modification

This instrument does not contain any user-serviceable parts. Do not disassemble, modify or attempt to repair it; patient or operator injury and/or equipment damage can result. This instrument is to be repaired by Olympus technicians only.

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.

Warnings and cautions

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

- Never perform electrosurgery with the BF-3C160/MP160F/XP160F, because the distal ends of these instruments are not insulated. Patient injury can result.
- After using this instrument, reprocess and store it according to the instructions given in the endoscope's companion reprocessing manual. Using improperly or incompletely reprocessed or stored instruments may cause patient cross-contamination and/or infection.
- Do not strike, bend, hit, pull, twist, or drop the endoscope's distal end, insertion tube, bending section, control section, universal cord, or endoscope connector with excessive force. The endoscope may be damaged and could cause patient injury, such as burns, bleeding, and/or perforation. It could also cause parts of the endoscope to fall off inside the patient.

- Never perform angulation forcibly or suddenly. Never forcefully pull or twist the angulated bending section. Patient injury, bleeding and/or perforation can result. It may also become impossible to straighten the bending section during use and/or to withdraw this instrument from the patient. Particular caution is required in the tracheal bifurcation region.
- Never operate the bending section, perform suction, insert or withdraw the endoscope's insertion tube without viewing the endoscopic image. Patient injury can result.
- Never insert or withdraw the endoscope while the endoscope's bending section is locked in position. When withdrawing the endoscope, the bending section should follow the form of the body cavity as much as possible. Otherwise, patient injury, bleeding and/or perforation can result. It may also become impossible to straighten the angle during use and/or to withdraw this instrument from the patient.
- Never use endo-therapy accessories without viewing the endoscopic image. Patient injury can result.
- Never operate the bending section, perform suction, insert or withdraw the endoscope's insertion tube while the image is frozen. Patient injury can result.
- Never use endo-therapy accessories while the image is frozen. Patient injury can result.
- Do not touch the light guide of the endoscope connector immediately after removing it from the light source because it is extremely hot. Operator or patient burns can result.
- Never insert or withdraw the insertion tube suddenly, abruptly or with excessive force. Patient injury, bleeding and/or perforation can result.
- Be sure to prepare another endoscope to avoid that the examination be interrupted due to equipment failure or malfunction.
- When the endoscopic image does not appear on the monitor, the CCD may have been damaged. Turn the video system center OFF immediately. Continued power supply in such a case will cause the distal end to become hot and could cause operator and/or patient burns.

CAUTION

- Do not pull the universal cord during an examination. The endoscope connector will be pulled out from the output socket of the light source and the endoscopic image will not be visible.
- Do not coil the insertion tube or universal cord into a diameter of less than 12 cm. Equipment damage can result.
- Do not apply shock to the distal end of the insertion tube, particularly the objective lens surface at the distal end. Visual abnormalities may result.
- Do not twist or bend the bending section with your hands. Equipment damage may result.
- Do not squeeze the bending section forcefully. The covering of the bending section may stretch or break and cause water leaks.
- The endoscope's remote switches cannot be removed from the control section. Pressing, pulling or twisting them with excessive force can break the switches and/or may cause water leaks.
- Do not attempt to bend the endoscope's insertion tube with excessive force. Otherwise the insertion tube may be damaged.
- The endoscope contains a memory chip that stores information about the endoscope and communicates this information to the CV-160. Although the memory chip is durable, damage will prevent data from being backed up on it. When data are lost or damaged, contact Olympus.

Precaution for disappeared or frozen endoscopic image

WARNING

- If the endoscopic image unexpectedly disappears or the frozen image cannot be restored during an examination, immediately stop using the instrument and withdraw the endoscope from the patient. Continued use of the endoscope in such condition may cause patient injury, bleeding and/or perforation.
- Follow the precautions given below. Otherwise, the endoscopic image may disappear unexpectedly or the frozen image may not be restored during the examination.
  - Connect the endoscope connector, videoscope cable and video system center completely. Otherwise, faulty contact can result.
  - Do not bend, hit or twist the insertion section, control section, universal cord and endoscope connector. The endoscope may be damaged and water leaks and/or breakage of internal parts like CCD cable can result.
  - Before inserting the endoscope, place the mouthpiece in the patient's mouth in order to prevent the patient from biting the insertion section. Biting the insertion section may result in breakage of the CCD cable or light guide.
  - Before immersing the endoscope, always attach the water-resistant cap. Otherwise, water will enter the endoscope and may cause short of the internal circuit. This may result in breakage of the switch and CCD.
  - If bubbles emerge from the endoscope continuously during leakage test, do not use the endoscope. Water may enter from the hole and short the internal circuit. This may result in breakage of the switch and CCD.

CAUTION

- Turn the video system center OFF before connecting or disconnecting the videoscope cable from the electrical connector on the endoscope. Turn the switch ON or OFF only when the videoscope cable is connected to both the video system center and electrical connector on the endoscope. Failure to do so can result in equipment damage, including destruction of the CCD.
- Do not touch the electrical contacts inside the electrical connector. CCD damage may result.

- Do not hit or bend the electrical contacts on the endoscope connector. The connection to the light source may be impaired and faulty contact can result.

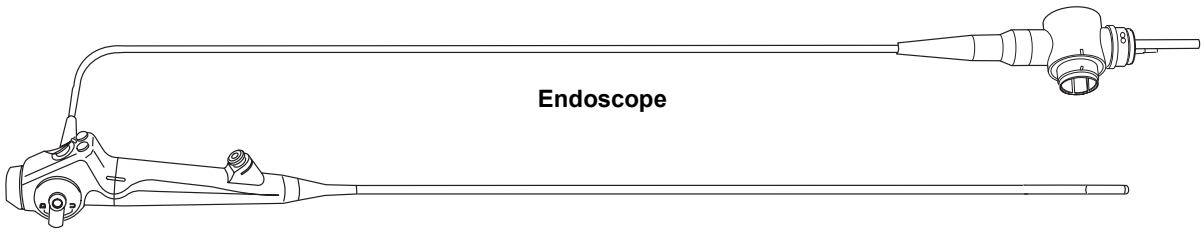
Examples of inappropriate handling

Details on clinical endoscopic technique are the responsibility of trained specialists. Patient safety in endoscopic examinations and endoscopic treatment can be ensured through appropriate handling by the physician and the medical facility. Examples of inappropriate handling are given below.

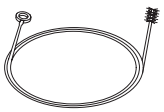
- Applying prolonged suction with the distal end in contact with the mucosal surface may cause bleeding or suction lesions.
- The endoscope has not been designed for use in retroflexed observation. Performing retroflexed observation in a narrow lumen may make it impossible to straighten the angle of the bending section and/or withdraw the endoscope from the patient.
- Inserting, withdrawing and using endo-therapy accessories without a clear endoscopic image may cause burns or perforation.
- Inserting or withdrawing the endoscope, applying suction or operating the bending section without a clear endoscopic image may cause patient injury.

Chapter 1 Checking the Package Contents

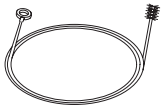
Match all items in the package with the components shown below. Inspect each item for damage. If the instrument is damaged, a component is missing or you have any questions, do not use the instrument; immediately contact Olympus.
This instrument was not disinfected or sterilized before shipment.
Before using this instrument for the first time, reprocess it according to the instructions given in the endoscope's companion manual, the "REPROCESSING MANUAL" whose cover lists the model of your endoscope.



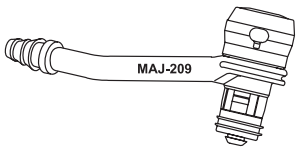
Endoscope



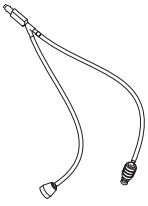
Channel cleaning brush (BW-15B, not for BF-3C160/XP160F)



Channel cleaning brush (BW-7B, for BF-3C160/XP160F)



Single-use suction valve (MAJ-209, 20 pcs)



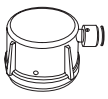
Suction cleaning adapter (MAJ-222)

Suction connector cleaning brush (BW-15SH, for BF-3C160/XP160F)

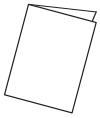
Channel-opening cleaning brush (MH-507)

Single-use biopsy valve (MAJ-210, 20 pcs)

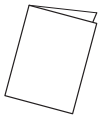
Mouthpiece (MA-651, 2 pcs)



Water-resistant cap (MH-553)



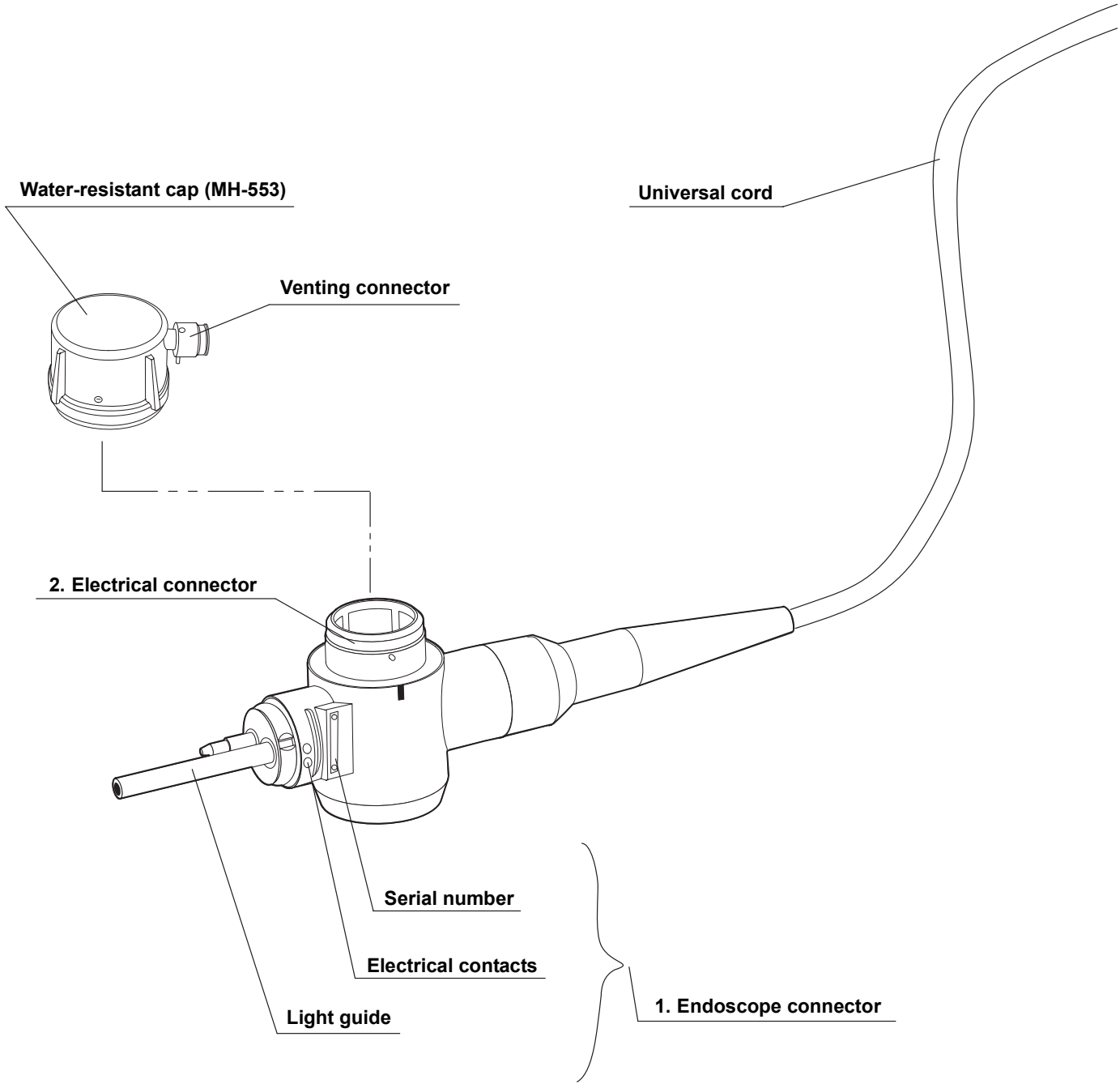
Operation manual

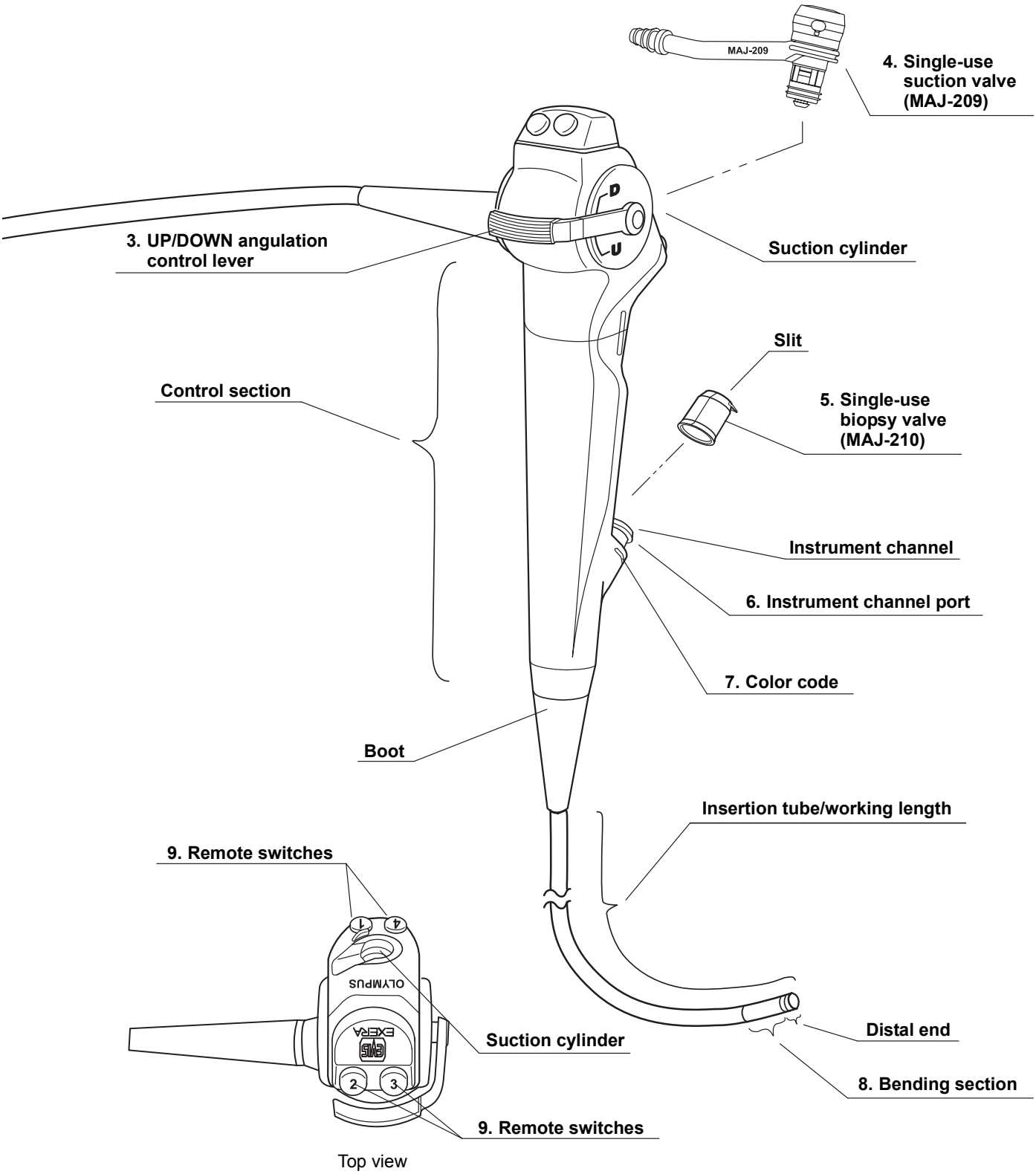


Reprocessing manual

Chapter 2 Instrument Nomenclature and Specifications

2.1 Nomenclature




MAJ-209
4. Single-use suction valve (MAJ-209)
D
U
3. UP/DOWN angulation control lever
Suction cylinder
Slit
Control section
5. Single-use biopsy valve (MAJ-210)
Instrument channel
6. Instrument channel port
7. Color code
Boot
Insertion tube/working length
9. Remote switches
OLYMPUS
EXERA
Suction cylinder
Distal end
8. Bending section
9. Remote switches

Top view

2.2 Endoscope functions

1. **Endoscope connector**
   This connector connects the endoscope to the output socket of the light source and transmits light from the light source to the endoscope.
2. **Electrical connector**
   This connector connects the endoscope to the video system center via the videoscope cable. The endoscope contains a memory chip that stores information about the endoscope and communicates this information to the video system center CV-160. For more details, refer to the instruction manual of the CV-160.
3. **UP/DOWN angulation control lever**
   When this lever is turned in the “U” direction, the bending section moves UP; when the lever is turned in the “D” direction, the bending section moves DOWN.
4. **Single-use suction valve (MAJ-209)**
   This valve is depressed to activate suction. The valve is used to remove any fluid and debris that obstruct the visual field.
5. **Single-use biopsy valve (MAJ-210)**
   Accessories may be inserted through the slit in this valve. A syringe may be inserted for the introduction of fluids.
6. **Instrument channel port**
   This channel port functions as:
   - channel for the insertion of endo-therapy accessories
   - suction channel
   - fluid feed channel (from a syringe via the biopsy valve)

WARNING

The BF-1T160 instrument channel has an inner diameter of ø 2.8 mm, but only endo-therapy accessories with an outer diameter of ø 2.6 mm (green) should be used. If the endo-therapy accessories with an outer diameter of ø 2.8 mm (yellow) are used, the instrument may be damaged.

7. **Color code**

This code is used to quickly determine the compatibility of endo-therapy accessories. The endoscope can be used with endo-therapy accessories that have the same color code.

- Blue : BF-160, BF-P160, BF-MP160F
- Green : BF-1T160
- Yellow : BF-XT160
- White : BF-3C160, BF-XP160F

NOTE

Some BF-3C160 does not have color code. If you use endo-therapy accessories with the BF-3C160, refer to the "System chart" in the Appendix for help in selecting compatible endo-therapy accessories.

8. **Bending section**

This section moves the distal end of the endoscope when the UP/DOWN angulation control lever is operated.

9. **Remote switches 1 to 4**

The functions of the remote switches 1 to 4 can be selected on the video system center. When selecting the functions, refer to the instruction manual for the video system center.

2.3 Specifications

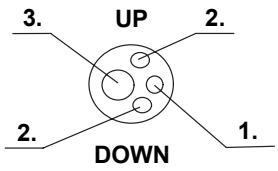
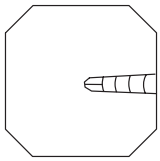
NOTE

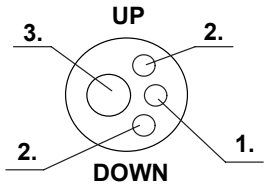
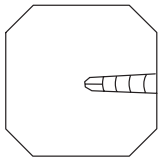
The BF-MP160F/XP160F differ from a general videoscope. The endoscopic image is transmitted to the control section by the image guide and converted into an electrical signal with the CCD in the control section.

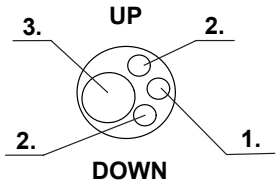
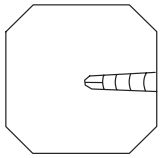
Operating environment

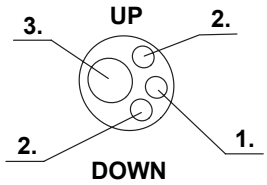
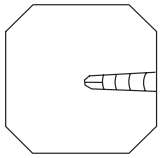
Operating environment	**Ambient temperature**	10 – 40°C (50 – 104°F)
	Relative humidity	30 – 85%
	Air pressure	700 – 1060 hPa (0.7 – 1.1 kgf/cm^2) (10.2 – 15.4 psia)

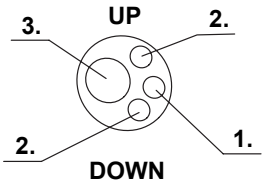
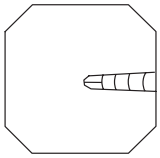
Specifications

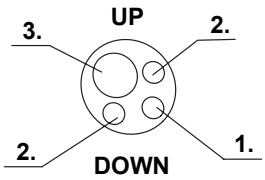
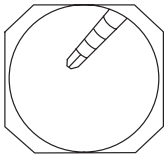
Model		BF-160
Optical system	**Field of view**	120°
	Direction of view	Forward viewing
	Depth of field	3 – 100 mm
Insertion tube	**Distal end outer diameter**	ø 5.3 mm
	Distal end enlarged	1. Objective lens 2. Light guide lens 3. Instrument channel outlet 
	Insertion tube outer diameter	ø 5.2 mm
	Working length	600 mm
Instrument channel	**Channel inner diameter**	ø 2.0 mm
	Minimum visible distance	3 mm from the distal end
	Direction from which endo-therapy accessories enter and exit the endoscopic image	
Bending section	**Angulation range**	UP 180°, DOWN 130°
Total length		870 mm

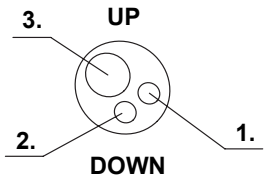
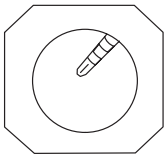
Model		**BF-P160**
Optical system	**Field of view**	120°
	Direction of view	Forward viewing
	Depth of field	3 – 100 mm
Insertion tube	**Distal end outer diameter**	ø 4.8 mm
	Distal end enlarged	1. Objective lens 2. Light guide lens 3. Instrument channel outlet 
	Insertion tube outer diameter	ø 4.9 mm
	Working length	600 mm
Instrument channel	**Channel inner diameter**	ø 2.0 mm
	Minimum visible distance	3 mm from the distal end
	Direction from which endo-therapy accessories enter and exit the endoscopic image	
Bending section	**Angulation range**	UP 180°, DOWN 130°
Total length		870 mm

Model		BF-1T160
Optical system	Field of view	120°
	Direction of view	Forward viewing
	Depth of field	3 – 100 mm
Insertion tube	Distal end outer diameter	ø 6.0 mm
	Distal end enlarged	1. Objective lens 2. Light guide lens 3. Instrument channel outlet 
	Insertion tube outer diameter	ø 6.0 mm
	Working length	600 mm
Instrument channel	Channel inner diameter	ø 2.8 mm
	Minimum visible distance	3 mm from the distal end
	Direction from which endo-therapy accessories enter and exit the endoscopic image	
Bending section	Angulation range	UP 180°, DOWN 130°
Total length		870 mm

Model		**BF-XT160**
Optical system	**Field of view**	120°
	Direction of view	Forward viewing
	Depth of field	3 – 100 mm
Insertion tube	**Distal end outer diameter**	ø 6.2 mm
	Distal end enlarged	1. Objective lens 2. Light guide lens 3. Instrument channel outlet 
	Insertion tube outer diameter	ø 6.3 mm
	Working length	600 mm
Instrument channel	**Channel inner diameter**	ø 3.2 mm
	Minimum visible distance	3 mm from the distal end
	Direction from which endo-therapy accessories enter and exit the endoscopic image	
Bending section	**Angulation range**	UP 180°, DOWN 130°
Total length		870 mm

Model		BF-3C160
Optical system	Field of view	120°
	Direction of view	Forward viewing
	Depth of field	3 – 100 mm
Insertion tube	Distal end outer diameter	ø 3.8 mm
	Distal end enlarged	1. Objective lens 2. Light guide lens 3. Instrument channel outlet 
	Insertion tube outer diameter	ø 3.8 mm
	Working length	600 mm
Instrument channel	Channel inner diameter	ø 1.2 mm
	Minimum visible distance	3 mm from the distal end
	Direction from which endo-therapy accessories enter and exit the endoscopic image	
Bending section	Angulation range	UP 180°, DOWN 130°
Total length		870 mm

Model		**BF-MP160F**
Optical system	**Field of view**	120°
	Direction of view	Forward viewing
	Depth of field	3 – 50 mm
Insertion tube	**Distal end outer diameter**	ø 4.0 mm
	Distal end enlarged	1. Objective lens 2. Light guide lens 3. Instrument channel outlet 
	Insertion tube outer diameter	ø 4.4 mm
	Working length	600 mm
Instrument channel	**Channel inner diameter**	ø 2.0 mm
	Minimum visible distance	3 mm from the distal end
	Direction from which endo-therapy accessories enter and exit the endoscopic image	
Bending section	**Angulation range**	UP 180°, DOWN 130°
Total length		870 mm

Model		BF-XP160F
Optical system	**Field of view**	90°
	Direction of view	Forward viewing
	Depth of field	2 – 50 mm
Insertion tube	**Distal end outer diameter**	ø 2.8 mm
	Distal end enlarged	1. Objective lens 2. Light guide lens 3. Instrument channel outlet 
	Insertion tube outer diameter	ø 2.8 mm
	Working length	600 mm
Instrument channel	**Channel inner diameter**	ø 1.2 mm
	Minimum visible distance	1.5 mm from the distal end
	Direction from which endo-therapy accessories enter and exit the endoscopic image	
Bending section	**Angulation range**	UP 180°, DOWN 130°
Total length		870 mm

Year of manufacture	**1<u>3</u>12345**	The last digit of the year of manufacture is given in the second digit of the serial number.
Degree of protection against electric shock		TYPE BF applied part

Chapter 3 Preparation and Inspection

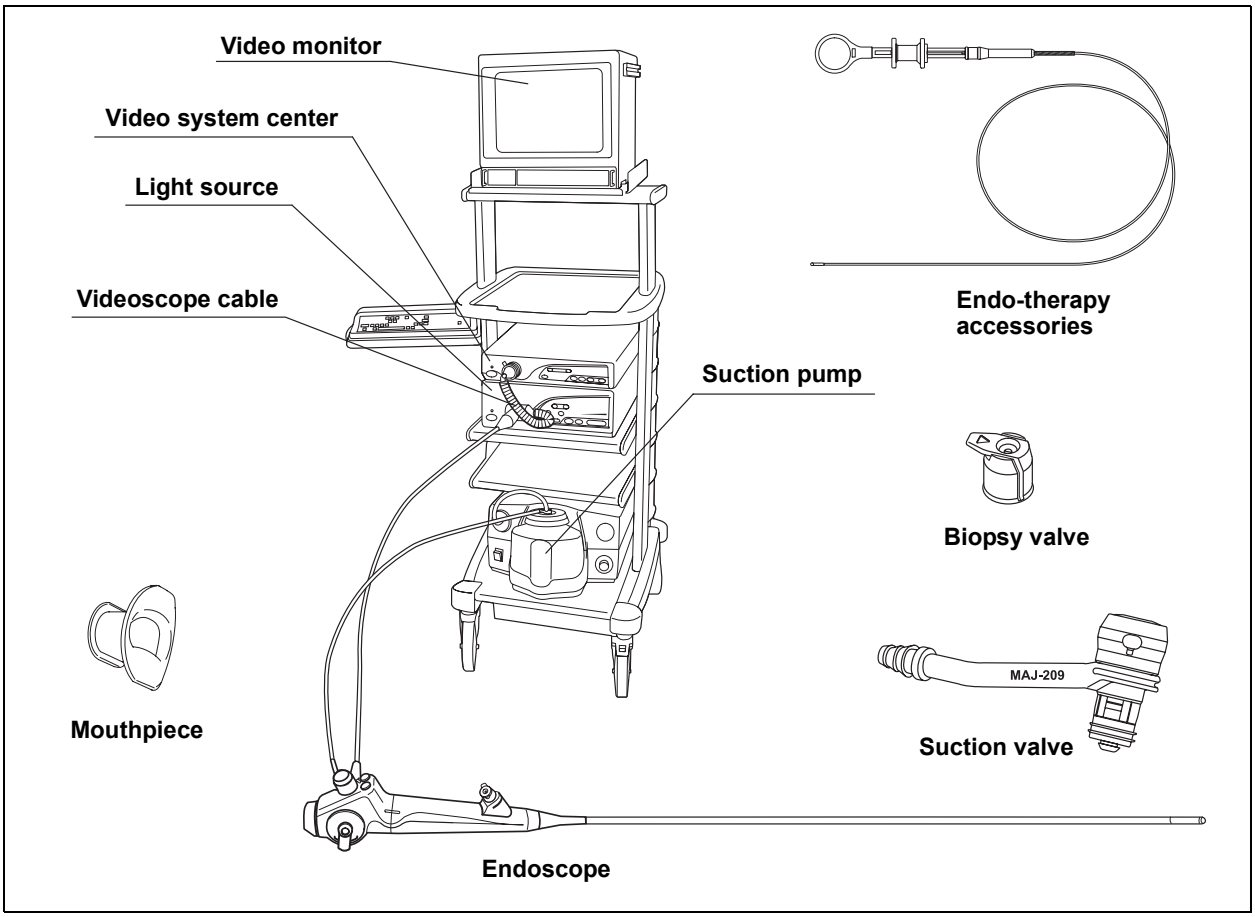
Before each case, prepare and inspect this instrument as instructed below. Inspect other equipment to be used with this instrument as instructed in their respective instruction manuals. If this instrument malfunctions, do not use it. Return it to Olympus for repair as described in Section 5.3, “Returning the endoscope for repair”.
If any irregularities are suspected after inspection, follow the instructions given in Chapter 5, “Troubleshooting”.

WARNING

- Using an endoscope that is not functioning properly may compromise patient or operator safety and may result in more severe equipment damage.
- This instrument was not cleaned, disinfected or sterilized before shipment. Before using this instrument for the first time, reprocess it according to the instructions given in the endoscope’s companion manual, the “REPROCESSING MANUAL” whose cover lists the model of your endoscope.

3.1 Preparation of the equipment

Prepare the equipment shown in Figure 3.1 (for compatibility, see the “System chart” in the Appendix) and personal protective equipment, such as eye wear, face mask, moisture-resistant clothing and chemical-resistant gloves, before each use. Refer to the respective instruction manuals for each piece of equipment.



• Paper towels	• Trays	• Lint-free cloths	• Personal protective equipment

Figure 3.1

3.2 Inspection of the endoscope

Clean and disinfect or sterilize the endoscope as described in its companion reprocessing manual. Then remove the water-resistant cap from the endoscope connector.

Inspection of the endoscope

1. Inspect the control section and the endoscope connector for excessive scratching, deformation, loose parts or other irregularities.
2. Inspect the boot and the insertion tube near the boot for bends, twists or other irregularities.
3. Inspect the external surface of the entire insertion tube including the bending section and the distal end for dents, bulges, swelling, peeling, scratching, holes, sagging, transformation, bends, adhesion of foreign body, dropout of parts, any protruding objects or other irregularities.
4. Carefully run your fingertips over the entire length of the insertion tube. Inspect for any protruding objects or other irregularities. Also confirm that the insertion tube is not abnormally stiff (see Figure 3.2).

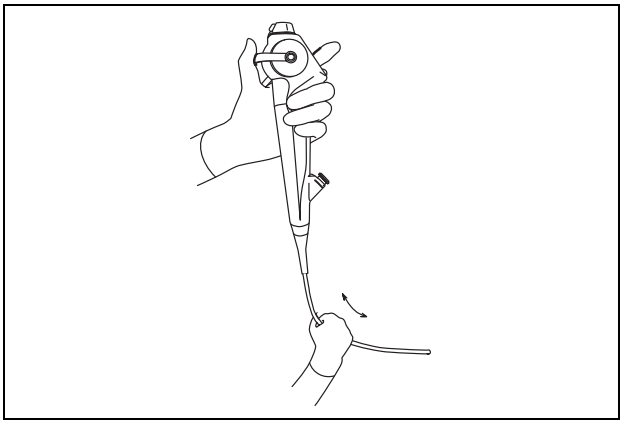


Figure 3.2

5. Inspect the covering of the bending section for sagging, swelling, cuts, holes or other irregularities.
6. Gently hold the midpoint of the bending section and a point 20 cm from the distal end. Push and pull gently to confirm that the connection between the bending section and the insertion tube is not loose.
7. Inspect the objective lens at the distal end of the endoscope's insertion tube for scratching, cracks, stains, gaps around the lens or other irregularities.

Inspection of the bending mechanism

Perform the following inspections while the bending section is straight.

WARNING

If the movement of the angulation control lever is not smooth, or the bending section does not angulate smoothly, the bending mechanism may be abnormal. In this case, do not use the endoscope because it may become impossible to straighten the bending section during an examination.

1. Turn the UP/DOWN angulation control lever slowly in each direction until it stops. Confirm that the bending section angulates smoothly and correctly and that maximum angulation can be achieved.
2. Turn the UP/DOWN angulation control lever slowly to its neutral position. Confirm that the bending section returns smoothly to an approximately straight condition.

3.3 Preparation and inspection of accessories

Inspection of the single-use suction valve (MAJ-209)

WARNING

- The suction valve is provided in a sterile condition. Do not open the package until you are ready to use it.
- Do not use an instrument after the expiration date displayed on the sterile package. Doing so may pose an infection control risk.
- Do not attempt to reuse or sterilize the suction valve. This could pose an infection control risk or cause equipment damage.

NOTE

This suction valve is designed for use with BF-30, 40, 200, 240 and 160 series endoscopes.

1. Inspect the sterile package for tears, inadequate sealing or water damage. If the sterile package shows any irregularities, the sterile condition of the instrument may have been compromised. Use a spare instead.
2. Confirm that the button can be pushed without excessive resistance.
3. Inspect the suction valve for cracks or other damage (see Figure 3.3).

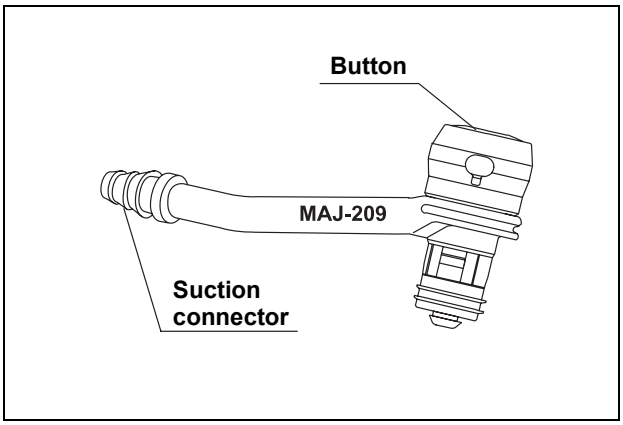


Figure 3.3

Inspection of the single-use biopsy valve (MAJ-210)

WARNING

- The biopsy valve is provided in a sterile condition. Do not open the package until you are ready to use it.
- Do not use an instrument after the expiration displayed on the sterile package. Doing so may pose an infection control risk.
- Do not attempt to reuse or sterilize the biopsy valve. This could pose an infection control risk or cause equipment damage.

NOTE

This valve is designed for use with BF-30, 40, 200, 240, and 160 series endoscopes.

1. Inspect the sterile package for tears, inadequate sealing or water damage. If the sterile package shows any irregularities, the sterile condition of the instrument may have been compromised. Use a spare instead.
2. Inspect the biopsy valve for cracks or other damage (see Figure 3.4).

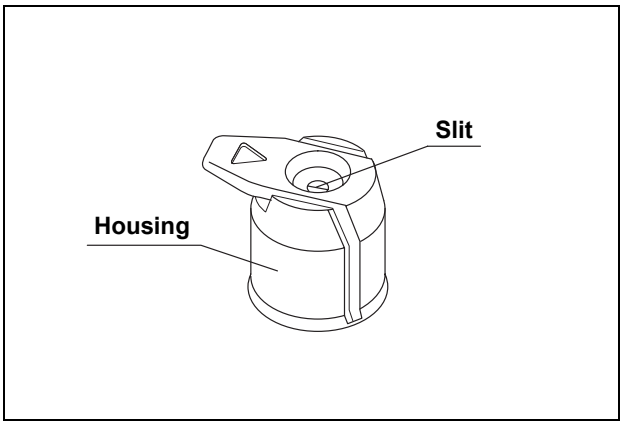


Figure 3.4

Inspection of the mouthpiece (MA-651)

CAUTION

Do not use a mouthpiece that is damaged, deformed or reveals other irregularities. Doing so may cause patient injury and/or equipment damage.

NOTE

Placing the mouthpiece in the patient's mouth before the procedure prevents the patient from biting and/or damaging the endoscope's insertion tube.

1. Confirm that the mouthpiece is free from cracks, deformation or discoloration (see Figure 3.5).

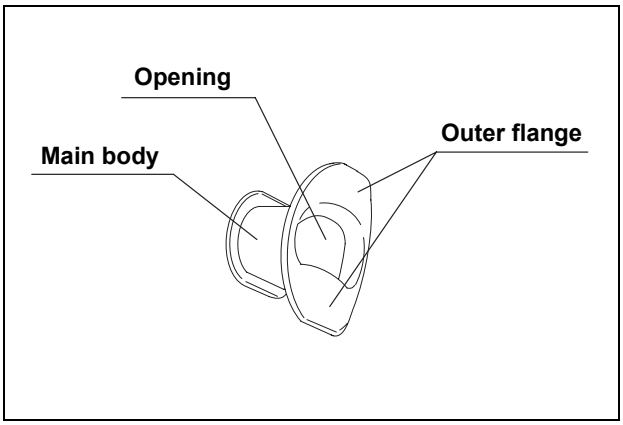


Figure 3.5

2. Using your fingers, check for excessive scratching or other irregularities on all surfaces of the mouthpiece (see Figure 3.5).

3.4 Attaching accessories to the endoscope

Attaching the suction valve

WARNING

Firmly attach the suction valve to the instrument channel port. If the suction valve is attached to the endoscope improperly with gap between the base of the suction valve and the top of the suction cylinder, suction valve may detached from the endoscope and may cause patient debris to leak or spray from the gap.

CAUTION

The suction valve does not require lubrication. Lubricants can cause swelling of the valves' seals, which will impair the valve function.

1. Place the suction valve into the suction cylinder, aligning the arm of the main body with the white mark on the endoscope (see Figure 3.6).
2. Press down on the suction valve's top surface with your both thumbs until it "clicks" into place (see Figure 3.6).

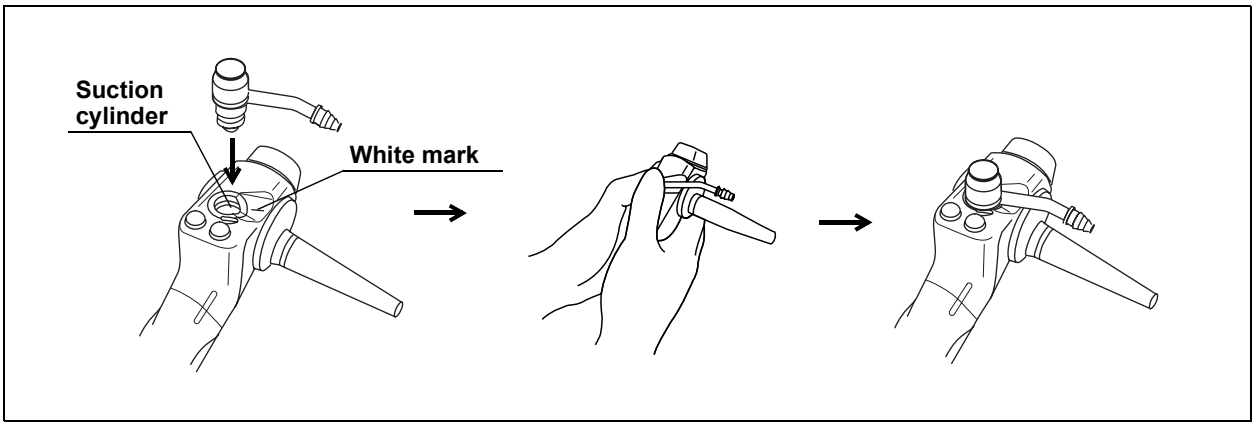


Figure 3.6

3. Inspect and verify that the base of the valve is in contact with the suction cylinder properly. Improper attachment, where a gap still exists between the base of the suction valve and the top of the suction cylinder (see Figure 3.7).

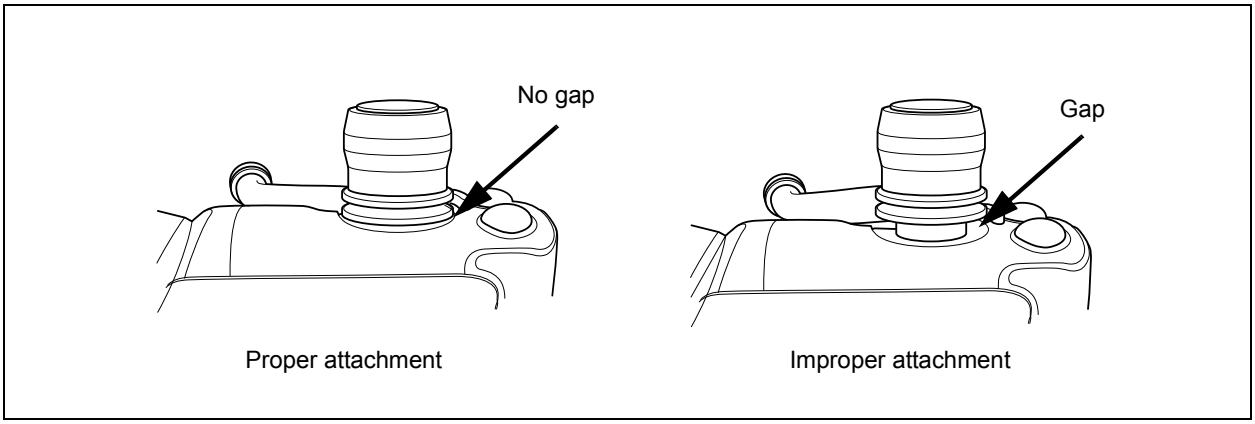


Figure 3.7

NOTE

Sometimes the suction valve will click before it is fully seated in the suction cylinder. Press the suction valve down firmly to ensure that it is fully seated in the suction cylinder.

Attaching the biopsy valve

WARNING

If the biopsy valve is not properly connected to the instrument channel port, it can reduce the efficacy of the endoscope's suction system and may cause patient debris to leak or spray from the endoscope.

Attach the biopsy valve to the instrument channel port with its tab near side in the illustrated direction.
Push the upper part of the biopsy valve down slantingly onto the instrument channel port until the valve snaps into place (see Figure 3.8).

NOTE

At low temperatures, the housing may become stiff and difficult to attach.

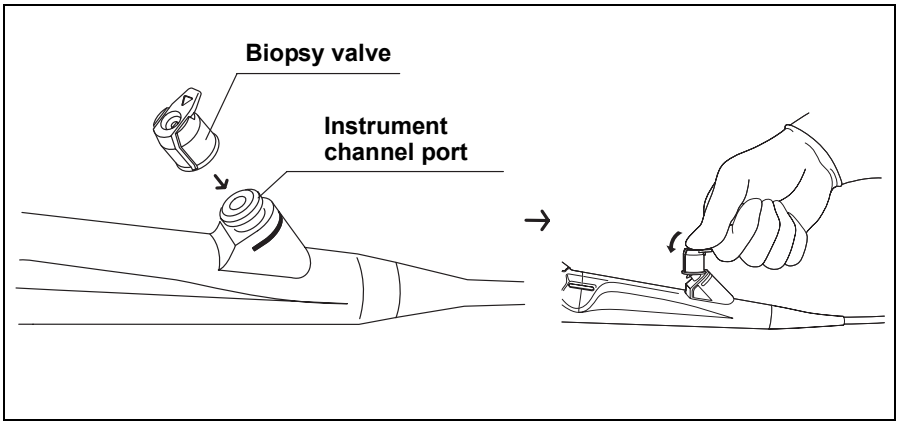


Figure 3.8

3.5 Inspection and connection of ancillary equipment

Inspection of ancillary equipment

CAUTION

- BF-160 series endoscopes are not compatible with the video system center CV-200/240/260.
- For the BF-P160/XT160/3C160, use the video system center CV-160 only. These endoscopes are not compatible with the video system center CV-100/140.

Prepare and inspect the light source, video system center, video monitor, suction pump and endo-therapy accessories as described in their respective instruction manuals.

Connection of the endoscope and ancillary equipment

WARNING

- If the endoscope connector, videoscope cable and video system center are not connected properly, the endoscopic image may have flicker or not be displayed. Continuous use of such endoscope may cause patient injury, bleeding or perforation.
- Firmly connect the suction tube from the suction pump to the suction connector on the suction valve. If the suction tube is not attached properly, debris may drip from the tube. The patient, operator and/or equipment could be contaminated and equipment malfunction can result.

CAUTION

- For the BF-P160/XT160/3C160, use the videoscope cable EXERA (MAJ-843) only. These endoscopes are not compatible with the videoscope cable 100 (MD-680 or MD-148).
- For more information on combining the endoscope with the video system center and the videoscope cable, refer to the “System chart” in the Appendix.

1. If any ancillary equipment is ON, turn it OFF.
2. Insert the endoscope connector completely into the output socket of the light source.

3. Align the mark on the videoscope cable with mark 1 on the endoscope connector and push it in until it stops (see Figure 3.9).

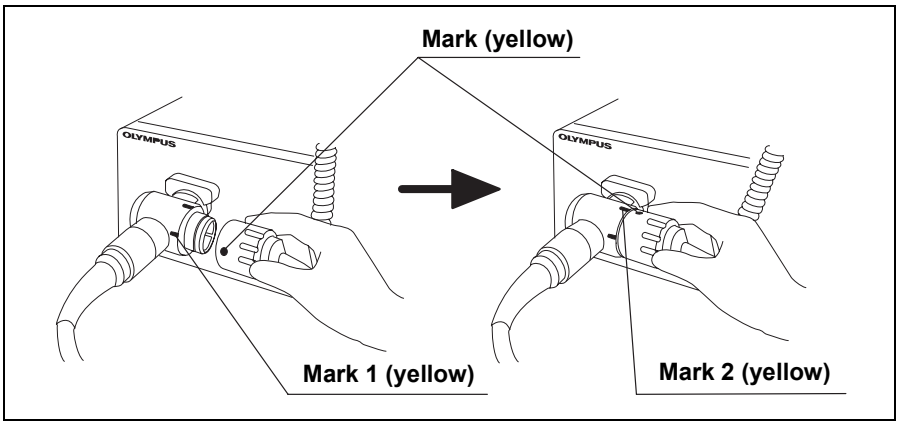


Figure 3.9

4. Turn the connector of the videoscope cable clockwise until it stops (see Figure 3.9).

5. Confirm that the mark on the videoscope cable is aligned with mark 2 on the endoscope connector.

6. Connect the suction tube from the suction pump to the suction connector on the suction valve (see Figure 3.10).

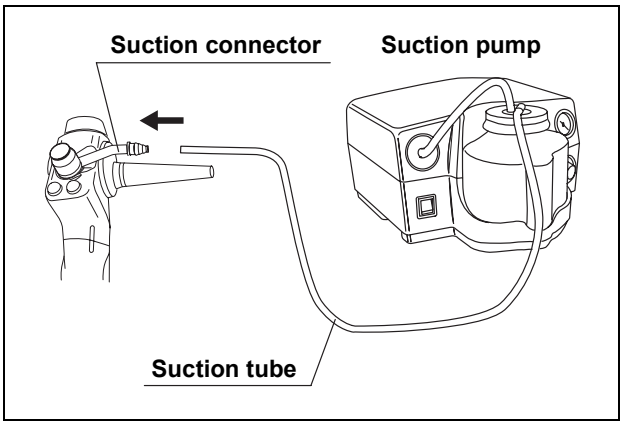


Figure 3.10

3.6 Inspection of the endoscopic system

Inspection of the endoscopic image

1. Before inspection, wipe the objective lens with clean, lint-free cloths moistened with 70% ethyl or isopropyl alcohol.
2. Turn on the video system center, light source, video monitor and inspect the endoscopic image as described in their respective instruction manuals.
3. Adjust the brightness level as appropriate.
4. While observing the palm of your hand, confirm that the examination light is output and that the endoscopic image is free from noise, blur, fog or other irregularities.
5. Angulate the bending section and confirm that the endoscopic image is free from momentary disappearing or other irregularities.

Inspection of Remote Switch

WARNING

All remote control switches should be confirmed to work normally even when they are not expected for use. Endoscopic image may freeze or other irregularities may occur during examination and may cause injury, bleeding and/or perforation.

Depress every remote control switches and confirm that the specified functions work normally.

Inspection of the suction function

WARNING

Do not aspirate with a pressure of more than 670 hPa (0.68 kgf/cm^2, 9.7 psia). Using higher pressure may make it difficult to stop suction.

1. Immerse the distal end of the insertion tube in sterile water and depress the suction valve. Confirm that water is continuously aspirated into the suction bottle on the suction pump.
2. Release the suction valve. Confirm that suction stops and the valve returns to its original position.

3. Remove the distal end from the water. Depress the suction valve and aspirate air for a few seconds to remove any water from the instrument channel.

Inspection of the instrument channel

CAUTION

Keep your eyes away from the distal end when inserting endo-therapy accessories. Extending the endo-therapy accessory from the distal end could cause eye injury.

1. Insert the endo-therapy accessory through the biopsy valve. Confirm that the endo-therapy accessory extends smoothly from the distal end.
2. Confirm that the endo-therapy accessory can be withdrawn smoothly from the biopsy valve.

Inspection of the water feeding function

1. Insert a syringe filled with sterile water into the biopsy valve and depress the plunger.
2. Confirm that water is discharged from the distal end of the endoscope.

NOTE

- For proper operation, the syringe must be inserted fully and held perpendicular to the biopsy valve. Angled or incomplete insertion may result in fluid leakage from the biopsy valve.
- Do not press the suction valve during water feeding. If the suction valve is pressed during water feeding, water will be aspirated into the suction tube instead of being discharged from the endoscope's distal end.
- If fluid is not discharged from the endoscope's distal end, flush air through the channel.

Chapter 4 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 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 this instrument.

WARNING

- Wear personal protective equipment to guard against dangerous chemicals and potentially infectious material during operation. During operation, wear appropriate personal 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.
- The temperature of the distal end of the endoscope may exceed 41°C (106°F) and reach 50°C (122°F) due to intense endoscopic illumination. Surface temperatures over 41°C (106°F) may cause mucosal burns. Always use the minimum level of illumination, minimum time and suitable distance necessary for adequate viewing. Whenever possible, avoid close stationary viewing and do not leave the distal end of the endoscope close to the mucous membrane for a long time.
- Whenever possible, do not leave the endoscope illuminated before and/or after an examination. Continued illumination will cause the distal end of the endoscope to become hot and could cause operator and/or patient burns.
- Turn the video system center ON to operate the light source's automatic brightness function. When the video system center is OFF, it cannot operate the light source's automatic brightness function, and the light intensity is set to the maximum level. In this case, the distal end of the endoscope can become hot and could cause operator and/or patient burns.

- Never insert or withdraw the endoscope under any of the following conditions. Otherwise, patient injury can result.
  - While the endo-therapy accessory extends from the distal end of the endoscope.
  - While the bending section is locked in position.
  - Use of excessive force, or forcible insertion or withdrawal.
- If any of the following phenomena occur during an examination, immediately stop the examination and withdraw the endoscope from the patient as described in Section 5.2, “Withdrawal of the endoscope with an abnormality”.
  - If any abnormality is suspected with the functionality of the endoscope.
  - If the endoscopic image on the video monitor disappears or freezes unexpectedly.
  - If the endoscopic image on the video monitor appears blur or fog unexpectedly.
  - If the angulation control mechanism is not functioning properly.

  Continued use of the endoscope under these conditions could result in patient injury.
- If an abnormal endoscopic image/function occurs and returns to its normal condition by itself, the endoscope has malfunctioned. In this case, stop using the endoscope because the abnormality can occur again and may not return to its normal condition. Therefore, stop the examination immediately and slowly withdraw the endoscope while viewing the endoscopic image. Otherwise, patient injury can result.

4.1 Insertion

Holding and manipulating the endoscope

The control section of the endoscope is designed to be held in the left hand. The suction valve can be operated using the left index finger. The UP/DOWN angulation control lever can be operated using the left thumb. The right hand is free to manipulate the insertion tube (see Figure 4.1).

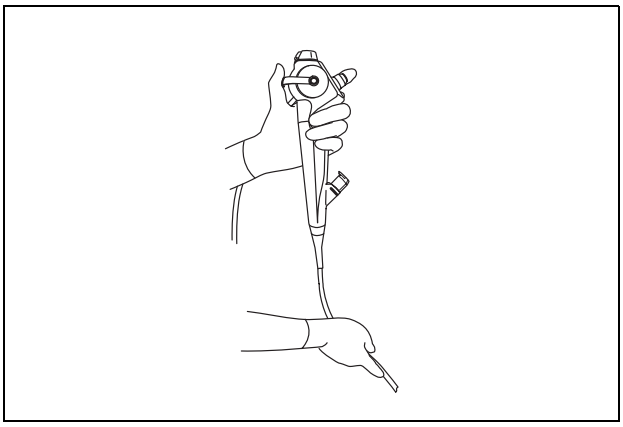


Figure 4.1

Insertion of the endoscope

CAUTION

- To prevent the patient from accidentally biting the insertion tube during an examination, it is strongly recommended that a mouthpiece be placed in the patient's mouth before inserting the endoscope.
- Do not apply olive oil or products containing petroleum-based lubricants (e.g. vaseline). These products may cause stretching and/or deterioration of the bending section's covering.
- Do not allow the insertion tube to be bent within a distance of 10 cm or less from the junction of the boot. Insertion tube damage can occur (see Figure 4.2).

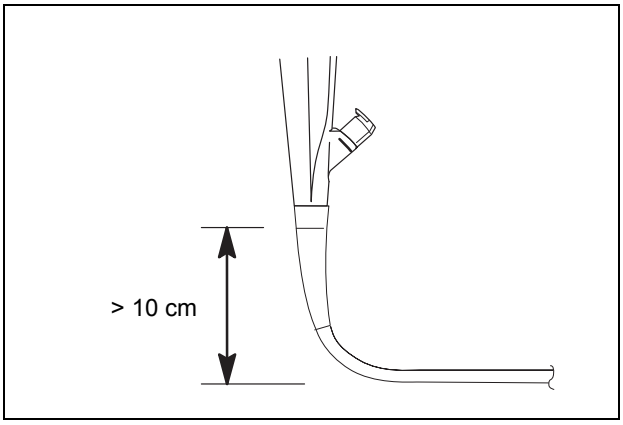


Figure 4.2

1. If necessary, apply a medical-grade, water-soluble lubricant to the insertion tube.
2. Place the mouthpiece between the patient's teeth or gums, with the outer flange on the outside of the patient's mouth.
3. Insert the distal end of the endoscope through the opening of the mouthpiece, then from the mouth to the pharynx, while viewing the endoscopic image.

Angulation of the distal end

Operate the angulation control lever as necessary to guide the distal end for insertion and observation.

Feeding fluids and suction

❍ Feeding fluids

CAUTION

Do not depress the suction valve while feeding fluids. Otherwise, the fluids will be aspirated into the suction pump.

Securely insert a syringe into the slit of the biopsy valve and press the plunger.

❍ Suction

WARNING

Avoid aspirating solid matter or thick fluids; channel or valve clogging can occur. If the suction valve clogs and suction cannot be stopped, disconnect the suction tube from the suction connector on the suction valve. Turn the suction pump OFF.

CAUTION

During the procedure, take notice that the suction bottle does not fill completely. Aspirating fluids into a full bottle may cause the suction pump to malfunction.

Press the suction valve to aspirate excess fluid or other debris obscuring the endoscopic image (see Figure 4.3).

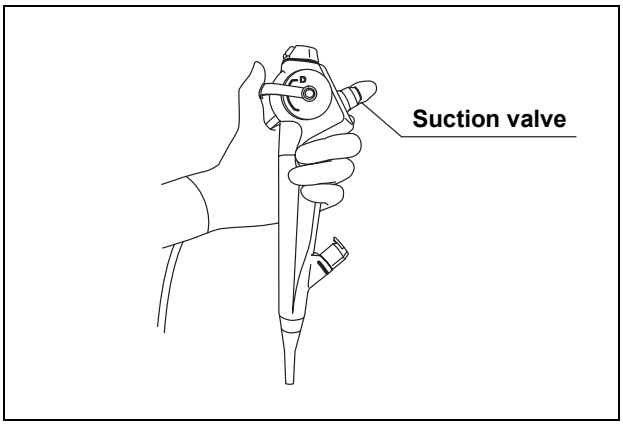


Figure 4.3

Observation of the endoscopic image

Refer to the light source's instruction manual for instructions on how to adjust the brightness.

NOTE

- For the BF-XP160F, the brightness setting on the video system center is too high. Set the iris mode selection switch on the video system center to peak iris mode. However, when the image turns dark by using endo-therapy accessories, set the iris mode selection switch to the average iris mode.
- For adjusting the white balance of the BF-XP160F, set the iris mode selection switch on the video system center to peak iris mode. Otherwise, it may not be possible to correctly adjust the white balance.

4.2 Using endo-therapy accessories

For more information on combining the endoscope with particular endo-therapy accessories, refer to the “System chart” in the Appendix and the instruction manuals of the accessories. Refer to the instruction manuals of the accessories for instructions on how to operate them properly.

WARNING

- When using endo-therapy accessories, keep the distance between the distal end of the endoscope and the mucous membrane greater than the endoscope’s minimum visible distance so that the endo-therapy accessory remains visible in the endoscopic image. If the distal end of the endoscope is placed closer than its minimum visible distance, the position of the accessory cannot be seen in the endoscopic image, which could cause serious injury and/or equipment damage. The minimum visible distance depends on the type of endoscope being used. Refer to Section 2.3, “Specifications”.
- When inserting or withdrawing an endo-therapy accessory, confirm that its distal end is closed or retracted into the sheath completely. Slowly insert or withdraw the endo-therapy accessory straight into/from the slit of the biopsy valve. Otherwise, the biopsy valve may be damaged and piece of it could fall off.
- If the insertion or withdrawal of endo-therapy accessories is difficult, straighten the bending section as much as possible without losing the endoscopic image. Inserting or withdrawing endo-therapy accessories with excessive force may damage the instrument channel or endo-therapy accessories, cause some parts to fall off and/or cause patient injury.
- If the distal end of an endo-therapy accessory is not visible within the endoscopic image, do not open the distal end or extend needle of the instrument. This could cause patient injury, bleeding, perforation and/or equipment damage.
- If an endo-therapy accessory cannot be withdrawn from the endoscope, close the tip of the endo-therapy accessory or retract the tip of the endo-therapy accessory into its sheath and slowly withdraw the endoscope while observing the endoscopic image.

- Do not use the channel cleaning brush for cytologic tissue sampling or other diagnostic or therapeutic purposes. Patient injury, cross-contamination and/or equipment damage may occur.

CAUTION

- When using a biopsy forceps with a needle, confirm that the needle is not bent excessively. A bent needle could protrude from the closed cups of the biopsy forceps. Using such a biopsy forceps could damage the instrument channel and/or cause patient injury.
- When using an injector, be sure not to extend or retract the needle from the catheter of the injector until the injector is extended from the distal end of the endoscope. The needle could damage the instrument channel if extended inside the channel, or if the injector is inserted or withdrawn while the needle is extended.

Insertion of endo-therapy accessories into the endoscope

WARNING

- The force required to insert an endo-therapy accessory is reduced if the biopsy valve's cap is detached from the main body. However, a detached cap can reduce the efficacy of the endoscope's suction system and may cause patient debris to leak or spray from the endoscope. Whenever endo-therapy accessories are not used, attach the biopsy valve's cap to the main body.
- Do not insert endo-therapy accessories forcibly or abruptly. Otherwise, the endo-therapy accessory may extend from the distal end of the endoscope abruptly, which could cause patient injury, bleeding and/or perforation.

1. Select endo-therapy accessories compatible with the instrument from the "System chart" in the Appendix. Also refer to the instruction manuals of the endo-therapy accessories.
2. Hold the UP/DOWN angulation control lever stationary.
3. Confirm that the tip of the endo-therapy accessory is closed or retracted into its sheath and insert the endo-therapy accessory slowly and straight into the slit of the biopsy valve.

CAUTION

- Do not open the tip of the endo-therapy accessory or extend the tip of the endo-therapy accessory from its sheath in the instrument channel. The instrument channel and/or the endo-therapy accessory may become damaged.
- Hold the endo-therapy accessory close to the biopsy valve and insert it straight into the biopsy valve using slow, short strokes. Otherwise, the endo-therapy accessory could bend or break.

4. Hold the endo-therapy accessory approximately 4 cm from the biopsy valve and advance it slowly and straight into the biopsy valve using slow, short strokes while observing the endoscopic image.

NOTE

When the tip of the endo-therapy accessory extends approximately 1 cm from the distal end of the endoscope, the accessory appears in the endoscopic image.

Operation of endo-therapy accessories

Operate the endo-therapy accessory according to the directions given in its instruction manual.

Withdrawal of endo-therapy accessories

WARNING

- Do not withdraw the endo-therapy accessory if the tip is open or extended from its sheath; patient injury and/or instrument damage may occur.
- If the endo-therapy accessory cannot be withdrawn from the endoscope, carefully withdraw both the endoscope and the endo-therapy accessory together under endoscopic observation. Take care not to cause tissue trauma.

Withdraw the endo-therapy accessory slowly while the tip of the endo-therapy accessory is closed and/or retracted into its sheath.

High frequency cauterization

WARNING

- Never perform electrosurgery with the BF-3C160/MP160F/XP160F, because the distal ends of these instruments are not insulated. Patient injury can result.
- Do not perform electrosurgery while supplying oxygen. This may result in combustion during cauterization.
- Always confirm that the electrode section of the electrosurgical accessory is an appropriate distance away from the distal end of the endoscope. Confirm that the green marking at the distal tip of the electrosurgical accessory can be observed on the endoscopic image (see Figure 4.4). If the electrode is used when too close to the distal end of the endoscope, the endoscope and/or ancillary equipment may be damaged. Using a damaged endoscope may cause patient injury.

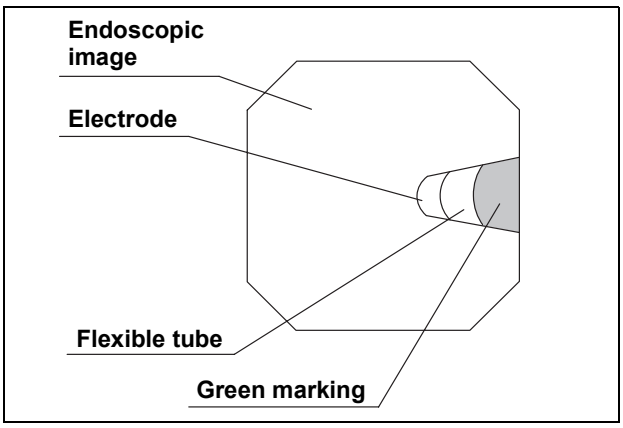


Figure 4.4

CAUTION

- Set the electrosurgical unit to the minimum necessary output level. If the output level is too high, the endoscope's and/or accessory's insulation may be damaged and cause patient and/or operator burns.
- Before performing electrosurgery, inspect the surface of the endoscope for any dents, bulges or other irregularities.
- When performing electrosurgery, do not use the electrosurgical unit's SPRAY coagulation mode. The endoscope may be damaged.

Prepare, inspect and connect the electrosurgical unit and electrosurgical accessories as described in their instruction manuals.

NOTE

- The external surfaces of the BF-160 series endoscopes (except the BF-3C160/MP160F/XP160F) are insulated. This allows electrosurgery to be performed.
- Some Olympus endoscopes are equipped with a feedback circuit to lead leakage current from the endoscope to the electrosurgical unit. However, the BF-160 series is not equipped with a feedback circuit, because leakage current from the electrosurgical accessory to the endoscope is minimal as the insertion tube is short. Therefore, the S-cord is unnecessary when using BF-160 series endoscope.
- For the electrosurgical unit PSD-10, the following P-cord is necessary:
  - P-cord (MB-582)
  - P-cord for disposable patient plate (MB-584)

  The S-P cord is unnecessary.
- The application of high frequency current may interfere with the endoscopic image. This is normal and does not indicate a malfunction.

Laser cauterization

WARNING

- The BF-MP160F/XP160F do not correspond to laser cauterization. If laser cauterization is performed using the BF-MP160F/XP160F, abnormalities in an endoscopic image may occur, which consequently may damage the inside of the patient body.
- Do not perform laser cauterization while supplying oxygen. This may result in combustion during cauterization.
- To avoid patient injury and/or damage to the endoscope, do not start laser radiation before confirming that the tip of the laser probe appears in the proper position in the endoscopic image. Keep an appropriate distance between the target and the endoscope's distal end and always use the lowest power output possible.

CAUTION

- Before inserting or withdrawing the laser probe, return the UP/DOWN angulation control lever to its neutral position so that the bending section will be straight. If it is bent, the instrument channel and/or the laser probe may be damaged.
- Allow the tip of the laser probe to cool down before pulling it in the channel. If the laser probe is withdrawn while hot, channel damage may occur.
- Do not use a damaged laser probe. A laser probe with a damaged sheath or distal end may cause patient injury and/or equipment damage.

Prepare, inspect and connect the laser unit and laser probe as described in their instruction manuals.

Ultrasonic observation

WARNING

- When withdrawing the ultrasonic probe with balloon sheath from the endoscope, make sure that the balloon is completely deflated. Withdrawing the probe while the balloon is inflated could result in patient injury and/or could damage the ultrasonic probe.
- When using the ultrasonic probe with balloon sheath, always lubricate the balloon before inserting the balloon sheath into the instrument channel. Otherwise, the balloon could rupture or come off. This could result in patient injury.

Prepare, inspect and connect the ultrasonic observation unit and ultrasonic probe as described in their instruction manuals.

NOTE

The ultrasonic probe with balloon sheath can be used in combination with the BF-1T160/XT160.

Bronchoalveolar lavage

❍ Using the BAL (bronchoalveolar lavage) kit

1. Disconnect the suction tube from the suction valve. Connect the suction tube to the suction connector of a commercially available BAL kit. Connect the BAL kit's suction line to the suction connector of the suction valve (see Figure 4.5).

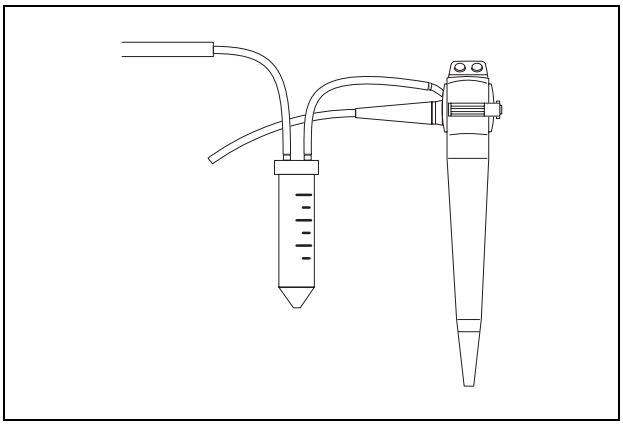


Figure 4.5

2. Securely insert a syringe filled with lavage fluid (e.g. saline) into the slit of the biopsy valve and press the plunger to feed lavage fluid.
3. Press the suction valve to aspirate lavage fluid.

Using a syringe

1. Securely insert a syringe into the slit of the biopsy valve.
2. Press the plunger to feed lavage fluid (see Figure 4.6 a).
3. With the syringe attached, slowly withdraw the plunger to aspirate lavage fluid (see Figure 4.6 b).

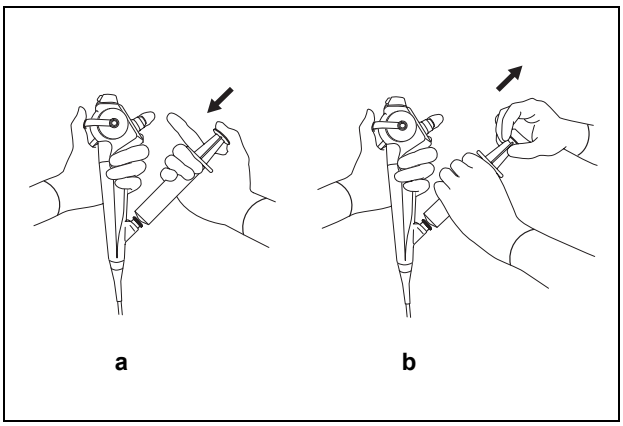


Figure 4.6

4.3 Withdrawal of the endoscope

WARNING

If the endoscope cannot be withdrawn from the patient smoothly, do not attempt to forcibly withdraw it; leave it inside the patient and immediately contact Olympus. Forcibly withdrawing the endoscope may cause patient injury.

1. Carefully withdraw the endoscope while observing the endoscopic image.
2. Remove the mouthpiece from the patient's mouth.

4.4 Transportation of the endoscope

Transporting within the hospital

When carrying the endoscope by hand, loop the universal cord, hold the endoscope connector together with the control section in one hand and hold the distal end of the insertion tube securely, but gently without squeezing, in the other hand (see Figure 4.7).

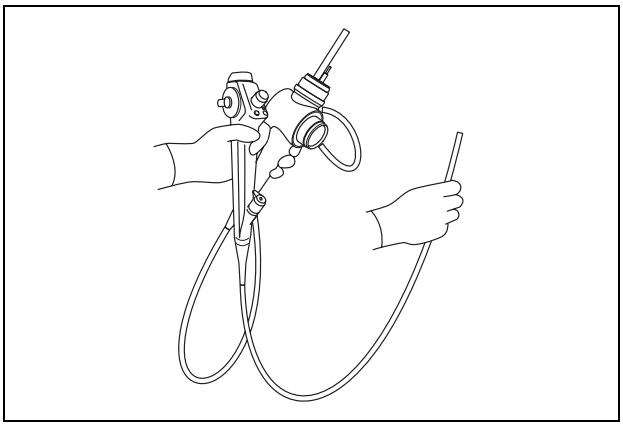


Figure 4.7

Transporting outside the hospital

Transport the endoscope in the carrying case.

WARNING

Always clean, disinfect or sterilize the endoscope after removing it from the carrying case.

CAUTION

- The carrying case cannot be cleaned, disinfected or sterilized. Clean and disinfect or sterilize the endoscope before placing it in the carrying case.
- Do not attach the water-resistant cap when transporting the endoscope, to avoid damage to the endoscope caused by changes in air pressure.

Chapter 5 Troubleshooting

If the endoscope is visibly damaged, does not function as expected or is found to have irregularities during the inspection described in Chapter 3, “Preparation and Inspection”, do not use the endoscope. Contact Olympus.
Some problems that appear to be malfunctions may be correctable by referring to Section 5.1, “Troubleshooting guide”. If the problem cannot be resolved by the described remedial action, stop using the endoscope and send it to Olympus for repair.
Olympus does not repair accessory parts. If an accessory part becomes damaged, contact Olympus to purchase a replacement.

WARNING

- Never use the endoscope on a patient if an abnormality is suspected. Damage or irregularity in the instrument may compromise patient or user safety and may result in more severe equipment damage.
- If any parts of the endoscope fall off inside the patient body due to equipment damage or failure, stop using the endoscope immediately and retrieve the parts in an appropriate way.

If any abnormality in the function of the endoscope and/or endoscopic image is suspected during use, stop the examination immediately and carefully withdraw the endoscope from the patient as described in Section 5.2, “Withdrawal of the endoscope with an abnormality”.

5.1 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.
Troubles or failures due to other causes than those listed below should be serviced. As repair performed by persons who are not qualified by Olympus could cause patient or user injury and/or equipment damage, be sure to contact Olympus for repair.

❍ Water feeding

Irregularity description	Possible cause	Solution
The fluid is leaking from the biopsy valve.	The biopsy valve is not attached properly.	Attach it correctly.
	The syringe is not inserted securely.	Insert it securely.
The biopsy valve cannot be attached.	The biopsy valve is damaged.	Replace it with a new one.

Suction

Irregularity description	Possible cause	Solution
The suction is absent or insufficient.	The biopsy valve is not attached properly.	Attach it correctly.
	The biopsy valve is damaged.	Replace it with a new one.
	The suction pump is not set properly.	Adjust the suction pump's setting as described in its instruction manual.
	The suction valve is damaged.	Replace it with a new one.
The suction valve is sticky.	The suction valve is damaged.	Replace it with a new one.
The suction valve does not return to its original position.	The aspiration pressure is too high.	Lower the aspiration pressure.
The suction valve cannot be attached.	An incorrect suction valve is used.	Use a correct suction valve.
	The suction valve is damaged.	Replace it with a new one.

Image quality or brightness

Irregularity description	Possible cause	Solution
There is no video image.	Not all power switches are ON.	Turn ON all the power switches.
An image is not clear.	The objective lens is dirty.	Clean the objective lens with a cotton swab moistened with 70% ethyl or isopropyl alcohol.
An image is excessively dark or bright.	The light source is not set properly.	Adjust the light source's setting as described in its instruction manual.
A black point is shown in a screen.	The image guide fiber has broken.	When the image to be observed is not visible, send the endoscope to Olympus for repair.

Endo-therapy accessories

Irregularity description	Possible cause	Solution
An endo-therapy accessory does not pass through the instrument channel smoothly.	An incompatible endo-therapy accessory is being used.	Refer to the “System chart” in the Appendix and select a compatible endo-therapy accessory. Confirm that the color code on the endo-therapy accessory matches that on the endoscope.

Others

Irregularity description	Possible cause	Solution
The remote switch does not work.	The wrong remote switch is operated.	Operate the correct remote switch.
	The remote switch function has been set improperly.	Set the remote switch function correctly as described in the video system center’s instruction manual.

5.2 Withdrawal of the endoscope with an abnormality

If an abnormality occurs while the endoscope is in use, take a proper measure as described in either “When the endoscopic image appears on the monitor” or “When the endoscopic image does not appear on the monitor or the frozen image cannot be restored” below. After withdrawal, return the endoscope for repair as described in Section 5.3, “Returning the endoscope for repair”.

WARNING

If the endoscope or endo-therapy accessory cannot be withdrawn from the patient smoothly, do not attempt to forcibly withdraw it; deal appropriately. If any irregularities are suspected, immediately contact Olympus. Forcibly withdrawing the endoscope or endo-therapy accessory may cause patient injury, bleeding and/or perforation.

When the endoscopic image appears on the monitor

1. Turn OFF all equipment except the video system center, light source, monitor and suction pump.
2. When using an endo-therapy accessory, withdraw the endo-therapy accessory slowly while the tip of the endo-therapy accessory is closed and/or retracted into its sheath.
3. Aspirate accumulated air, blood, mucus or other debris by depressing the suction valve.
4. Carefully withdraw the endoscope while observing the endoscopic image.
5. Remove the mouthpiece from the patient’s mouth.

When the endoscopic image does not appear on the monitor or the frozen image cannot be restored

1. Turn OFF all equipment except the video system center, light source and monitor.
2. Turn the video system center and light source OFF and then ON again. If the endoscopic image appears or the frozen image is restored, follow the procedure of Step 2. in “When the endoscopic image appears on the monitor” above.
   When the endoscopic image still does not appear or the frozen image cannot be restored, perform the following steps.
3. Turn OFF the video system center, the light source and the monitor.
4. When using an endo-therapy accessory, withdraw the endo-therapy accessory slowly while the tip of the endo-therapy accessory is closed and/or retracted into its sheath.
5. Turn the UP/DOWN angulation control lever to the neutral position. Release the angulation control lever and carefully withdraw the endoscope.
6. Remove the mouthpiece from the patient’s mouth.

5.3 Returning the endoscope for repair

WARNING

Thoroughly clean and high-level disinfect or sterilize the endoscope before returning it for repair. Improperly reprocessed equipment presents an infection control risk to each person who handles the endoscope within the hospital or at Olympus.

CAUTION

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

Before returning the endoscope for repair, contact Olympus. With the endoscope, include a description of the malfunction or damage and the name and telephone number of the individual at your location who is most familiar with the problem. Also include a repair purchase order.
When returning the endoscope for repair, follow the instructions given in “Transporting outside the hospital” on page 50.

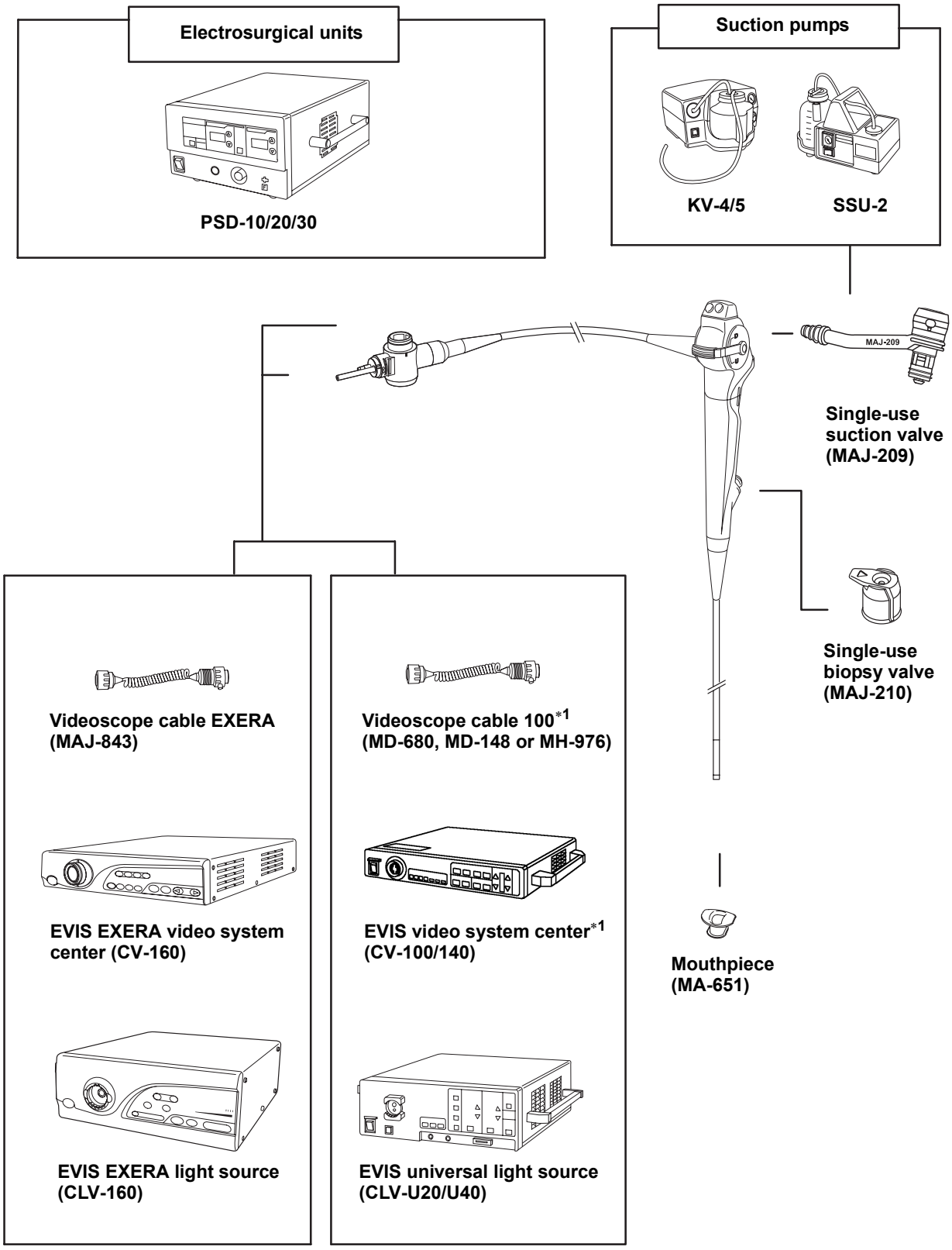
Appendix

System chart

The recommended combinations of equipment and accessories that can be used with this instrument are listed below. Some items may not be available in some areas. New products released after the introduction of this instrument may also be compatible for use in combination with this instrument. For further details, contact Olympus.

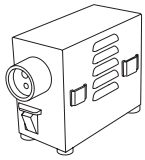
WARNING

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

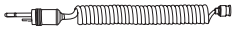


∗1 Not compatible with the BF-P160/XT160/3C160

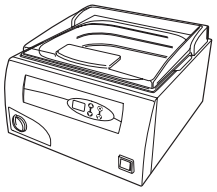
Cleaning and disinfection equipment



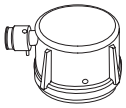
Maintenance unit (MU-1)



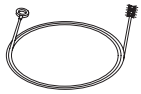
Leakage tester (MB-155)



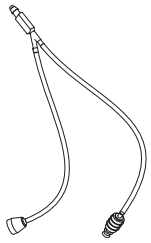
Ultrasonic cleaner (KS-2/ENDOSONIC)



Water-resistant cap (MH-553)



Channel cleaning brush (BW-15B, not for BF-3C160/XP160F)



Suction cleaning adapter (MAJ-222)

Channel-opening cleaning brush (MH-507)

Channel cleaning brush (BW-7B, for BF-3C160/XP160F)

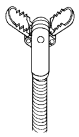
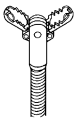
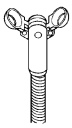
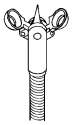
Suction connector cleaning brush (BW-15SH, for BF-3C160/XP160F)

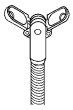
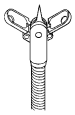
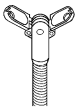
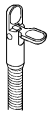
❍ EVIS EXERA video system center/EVIS video system centers

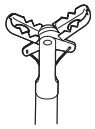
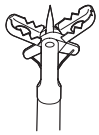
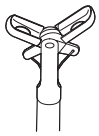
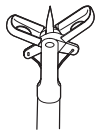
Endoscope	Videoscope cable 100	Videoscope cable EXERA	Videoscope cable 200/260
	CV-100/140	CV-160	CV-200/240/260
BF-P160	–	○	–
BF-160	○	○	–
BF-1T160	○	○	–
BF-XT160	–	○	–
BF-3C160	–	○	–
BF-MP160F	○	○	–
BF-XP160F	○	○	–

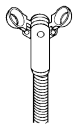
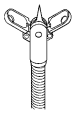
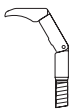
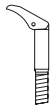
○ applicable – not applicable

❍ Endo-therapy accessories

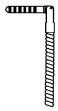
Endoscope	BIOPSY FORCEPS			
	Alligator jaws	Swing type	Fenestrated	Fenestrated with needle
				
BF-1T160	**FB-15C-1**	**FB-52C-1**	**FB-20C-1**	**FB-34C-1**
BF-160/P160/ MP160F	**FB-15C-1**	**FB-52C-1**	**FB-19C-1**	**FB-34C-1**
BF-XT160	**FB-36C-1**	**FB-52C-1**	**FB-35C-1**	**FB-34C-1**
BF-3C160/ XP160F	–	–	–	–

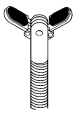
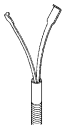
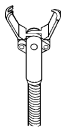
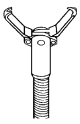
Endoscope	BIOPSY FORCEPS			
	Ellipsoid	Ellipsoid with needle	Rat tooth	Alligator type
				
BF-1T160	**FB-21C-1**	**FB-22C-1**	–	–
BF-160/P160/ MP160F	**FB-21C-1**	–	–	–
BF-XT160	**FB-21C-1**	**FB-24K-1**	**FB-37K-1**	**FB-11K-1**
BF-3C160/ XP160F	**FB-44D-1/56D-1**	–	–	–

Endoscope	DISPOSABLE BIOPSY FORCEPS (Fenestrated)			
	Alligator jaws (Swinging type)	**Alligator jaws with needle (Swinging type)**	**Oval (Swinging type)**	**Oval with needle (Swinging type)**
				
BF-1T160	**FB-211D**	**FB-221D**	**FB-231D**	**FB-241D**
BF-160/P160/ MP160F	**FB-211D**	**FB-221D**	**FB-231D**	**FB-241D**
BF-XT160	**FB-211D**	**FB-221D**	**FB-231D**	**FB-241D**
BF-3C160/ XP160F	–	–	–	–

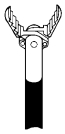
Endoscope	Fenestrated	Ellipsoid with needle	CURETTE	
				
BF-1T160	**FB-19CR-1**	**FB-22CR-1**	**CC-4CR-1**[*1]	**CC-5CR-1**[*1]
BF-160/P160/ MP160F	**FB-19CR-1**	–	**CC-4CR-1**[*1]	**CC-5CR-1**[*1]
BF-XT160	**FB-19CR-1**	**FB-22CR-1**	**CC-4CR-1**[*1]	**CC-5CR-1**[*1]
BF-3C160/ XP160F	–	–	–	–

∗1 These accessories may not be available in some areas.

Endoscope	CYTOLOGY BRUSH	BALLOON CATHETER	MEASURING DEVICE	
	Disposable		Standard	Bendable
				
BF-1T160	BC-202D -1210 to 5010	B5-2C	M1-1C*1	M2-1C/2C*1
BF-160/P160/ MP160F	BC-202D -1210 to 5010	B5-2C	M1-1C*1	M2-1C/2C*1
BF-XT160	BC-202D -1210 to 5010	B7-2C	M1-1C*1	M2-1C/2C*1
BF-3C160/ XP160F	BC-201C-1006/ BC-203D-2006	–	–	–

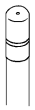
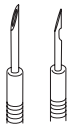
Endoscope	GRASPING FORCEPS			
	Rubber tips (Non-latex)	W-shape	Rat tooth	Sharp tooth
				
BF-1T160	FG-20P-1	FG-25C-1	FG-26C-1	–
BF-160/P160/ MP160F	FG-20P-1	–	–	–
BF-XT160	FG-20P-1	FG-25C-1	FG-26C-1	FG-32C-1
BF-3C160/ XP160F	–	–	–	–

*1 These accessories may not be available in some areas.

Endoscope	GRASPING FORCEPS			
	Alligator jaws	Basket type	Sperial basket type	
				
BF-1T160	–	–	**FG-51D**	**FG-52D**
BF-160/P160/ MP160F	–	–	**FG-51D**	**FG-52D**
BF-XT160	**FG-6L-1**	**FG-16L-1**	**FG-51D**	**FG-52D**
BF-3C160/ XP160F	–	–	**FG-51D**	**FG-52D**

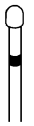
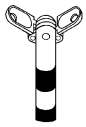
Endoscope	GRASPING FORCEPS			MAGNETIC EXRACTOR
	Three nail type	Parallel basket type	Loop type	
				
BF-1T160	**FG-54D**	**FG-55D**	**FG-36D**	**IE-2P**[*1]
BF-160/P160/ MP160F	**FG-54D**	**FG-55D**	**FG-36D**	**IE-2P**[*1]
BF-XT160	**FG-54D**	**FG-55D**	**FG-36D**	**IE-1L**[*1]
BF-3C160/ XP160F	**FG-54D**	**FG-55D**	**FG-36D**	–

∗1 These accessories may not be available in some areas.

Endoscope	CANNULA Standard type	SPRAY CATHETER Spray type	INJECTOR	ASPIRATION NEEDLE
				
BF-1T160	PR-2B-1	PW-6C-1	NM-1D[*1]/8L-1/9L-1	NA-1C-1/2C-1
BF-160/P160/ MP160F	PR-2B-1	PW-6C-1	NM-3K[*1]/8L-1/9L-1	NA-1C-1/2C-1
BF-XT160	PR-2B-1	PW-6C-1	NM-1D[*1], 4L-1 to 9L-1	NA-1C-1/2C-1
BF-3C160/ XP160F	–	–	–	–

∗1 These accessories may not be available in some areas.

❍ Electrosurgical accessories

Endoscope	ELECTROSURGICAL SNARE Crescent	 Large type	COAGULATION ELECTRODE Ball point	HOT BIOPSY FORCEPS
				
BF-1T160	SD-18C-1	SD-7C-1	CD-6C-1	FD-6C-1/7C-1
BF-160/P160	SD-18C-1	SD-7C-1	CD-6C-1	FD-7C-1
BF-XT160	SD-18C-1	SD-7C-1	CD-6C-1	FD-6C-1/7C-1

Endoscope	ELECTROSURGICAL KNIFE Flat
	
BF-1T160	KD-31C-1
BF-160/P160	KD-31C-1
BF-XT160	KD-31C-1

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