OLYMPUS®

INSTRUCTIONS

EXERA

OLYMPUS GIF/CF/PCF TYPE 160 Series

ENDOSCOPE REPROCESSING MANUAL

Refer to the endoscope's companion manual, the "OLYMPUS GIF/CF/PCF TYPE 160 Series OPERATION MANUAL" for inspection and operation information.

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

Contents

Chapter 1 General Policy

1.1 Instructions

- Chapters 1, "General Policy" through 4, "Cleaning and Disinfection Equipment" describe recommended procedures and equipment for cleaning and disinfecting or sterilizing this instrument.
- Thoroughly review the manuals of all equipment which will be used with this instrument and use the equipment as instructed.
- If you have any questions or comments about any information in this manual, or if a problem that cannot be solved occurs while reprocessing, contact Olympus.
- The medical literature reports incidents of patient cross contamination resulting from improper cleaning, disinfection or sterilization. It is strongly recommended that reprocessing personnel have a thorough understanding of and follow all national and local hospital guidelines and policies.
- A specific individual or individuals in the endoscopy unit should be responsible for reprocessing endoscopic equipment. It is highly desirable that a trained backup be available should the primary reprocessing individual(s) be absent.
- All individuals responsible for reprocessing should thoroughly understand:
  - occupational health and safety regulations
  - all national and local hospital guidelines and policies
  - the instructions in this manual
  - the mechanical aspects of endoscopic equipment
  - pertinent germicide labeling

1.2 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.

1.3 Precautions

WARNING

- Failure to properly clean and high-level disinfect or sterilize endoscopic equipment after each examination can compromise patient safety. To minimize the risk of transmitting diseases from one patient to another, after each examination the endoscope must undergo thorough manual cleaning followed by high-level disinfection or sterilization.
- If the endoscope is not cleaned meticulously, effective disinfection or sterilization may not be possible. Clean the endoscope and accessories thoroughly before disinfection or sterilization to remove microorganisms or organic material that could reduce the efficacy of disinfection or sterilization.
- Patient debris and reprocessing chemicals are hazardous. Wear personal protective equipment to guard against dangerous chemicals and potentially infectious material. During cleaning and disinfection or sterilization, 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. Always remove contaminated personal protective equipment before leaving the reprocessing area.

- Thoroughly rinse off the disinfectant solution. Rinse the external surface of the endoscope, channels and cleaning equipment thoroughly with clean water to remove any disinfectant solution residue.
- The disinfection/sterilization room must be adequately ventilated. Adequate ventilation protects against the buildup of toxic chemical fumes.
- Store alcohol in an air-tight container. Alcohol stored in an open container is a fire hazard and will lose its efficacy due to evaporation.

CAUTION

- When aerating or irrigating the endoscope channels, the air or water pressure must not exceed 0.5 MPa (5 kgf/cm^2, 71 psia).
- When reprocessing EVIS videoscope models, confirm that the water-resistant cap is securely attached to the endoscope connector before immersion in reprocessing fluids.
- When reprocessing an endoscope that has the flexibility adjustment mechanism, make sure that the insertion tube is set to the maximum flexibility (indicated by the "●" mark on the flexibility adjustment ring) before immersing the endoscope in cleaning/disinfectant solution.
  If the endoscope is cleaned and disinfected (or sterilized) while the insertion tube is too rigid, the endoscope may be damaged.

Chapter 2 Compatible Reprocessing Methods and Chemical Agents

2.1 Compatibility summary

Olympus endoscopic equipment is compatible with several methods of reprocessing. Certain components and accessories, however, are not compatible with some methods, which can cause equipment damage. For appropriate reprocessing methods, refer to Table 2.1 below, the recommendations of your infection control committee and all national and local hospital guidelines and policies.

	Steam sterilization (autoclaving)	ETO gas sterilization	2 – 3.2% glutaraldehyde	70% ethyl or isopropyl alcohol	Detergent solution	Ultrasonic cleaning
Endoscope		■	■	■	■	
Water-resistant cap (MH-553)		■	■	■		
Channel cleaning brush (BW-20T) Channel-opening cleaning brush (MH-507)	■	■	■	■		■
Air/water valve (MH-438) Suction valve (MH-443) Channel plug (MH-944) Injection tube (MH-946) Suction cleaning adapter (MH-856) AW channel cleaning adapter (MH-948) Mouthpiece (MB-142, MA-474) Biopsy valve (MB-358) Auxiliary water tube (MAJ-855)	■	■	■	■	■	■

■ Applicable □ Not applicable

Table 2.1

NOTE

Endo-therapy accessories which are marked by the words "AUTOCLAVE" or "AUTOCLAVABLE", or accessories with a green model reference label are compatible with autoclaving.

2.2 Detergent solution

Use a medical-grade, low-foaming, neutral pH detergent or enzymatic detergent and follow the manufacturer's dilution and temperature recommendations. Contact Olympus for the names of specific brands that have been tested for compatibility with the endoscope. Do not reuse detergent solutions.

WARNING

Excessive detergent foaming can prevent fluid from adequately contacting internal lumens (e.g. channels).

2.3 Disinfectant solution

In the U.S., agents used to achieve high-level disinfection are defined as liquid chemical germicides registered with the U.S. Food and Drug Administration as "sterilant/disinfectants" which are used according to the time, temperature and dilution recommended by the disinfectant manufacturer for achieving high-level disinfection. These conditions usually coincide with those recommended by the disinfectant manufacturer for 100% kill of mycobacterium tuberculosis.

In general, 2.0 – 3.2% glutaraldehyde solutions, when used according to the manufacturer's instructions for achieving high-level disinfection, are compatible with Olympus endoscopes. Contact Olympus for the names of specific brands that have been tested for compatibility with the endoscope.

If the disinfectant solution is reused, routinely check its efficacy with a test strip recommended by the manufacturer. Do not use solutions beyond their expiration date.

WARNING

Alcohol is not a sterilant or high-level disinfectant.

2.4 Rinsing water

Once removed from disinfectant solution, the instrument must be thoroughly rinsed with sterile water to remove any disinfectant residue. If sterile water is not available, clean potable tap water or water which has been processed (e.g. filtered) to improve its microbiological quality may be used.

When non-sterile water is used after disinfection, wipe the endoscope and flush the channels with 70% ethyl or isopropyl alcohol, then air-dry all internal channels to inhibit the growth of residual bacteria. Do not reuse rinsing water.

2.5 ETO gas sterilization

This instrument and other accessories listed as compatible with ethylene oxide (ETO) gas sterilization in Table 2.1 can be sterilized by ETO gas and aerated within the parameters given in Table 2.2. When performing sterilization, follow the hospital's protocol and the sterilization equipment manufacturer's instructions.

WARNING

- Before sterilization, the instrument must be thoroughly cleaned and dried. Residual moisture inhibits sterilization.
- Use biological indicators as recommended by your hospital's policy and follow the manufacturer's instructions, all national and local hospital guidelines and policies.
- All instruments must be properly aerated following ETO gas sterilization to remove toxic ethylene oxide residuals.
- Exceeding the recommended parameters may cause equipment damage.

ETO gas exposure parameters

Process		Parameters
ETO gas sterilization	Temperature	57°C (135°F)
	Pressure	0.1 – 0.17 MPa (1 – 1.7 kgf/cm^2) (16 – 24 psig)
	Humidity	55%
	Exposure time	1.75 hours
	ETO gas concentration	0.6 – 0.7 mg/cm^3 (600 – 700 mg/l)
Aeration	Minimum aeration parameters	12 hours in an aeration chamber at 50 – 57°C (122 – 135°F) or 7 days at room temperature

Table 2.2

Gas mixture

For the USA

12% ETO/88% CFC

For countries other than the USA

20% ETO/80% CO_2

2.6 Steam sterilization (autoclaving) of accessories

Steam sterilize (autoclave) within the parameters given in Table 2.3 below. When steam sterilizing, follow the hospital's protocol and the sterilization equipment manufacturer's instructions. Prior to steam sterilization (autoclaving) of accessories, meticulous manual cleaning followed by at least five minutes of ultrasonic cleaning at 38 – 47 kHz is required.

WARNING

- Use biological indicators as recommended by your hospital's policy and follow the manufacturer's instructions, all national and local hospital guidelines and policies.
- Exceeding the recommended parameters may cause equipment damage.

CAUTION

- Do not steam sterilize the endoscope. Steam sterilization (autoclaving) will severely damage the endoscope.
- Effective sterilization will not be possible if items are packed tightly together in the autoclave; always pack items loosely.
- Inspect each instrument package for openings, tears or other damage. If an instrument package is opened or damaged, seal the components in a new package and sterilize again.
- Allow the packages to dry within the autoclave, using the autoclave's drying cycle (if available) or by opening the door of the autoclave and allowing the packages to air dry. Handling a wet package can compromise its sterility.

Process	Parameters	
Prevacuum	Temperature	132 – 134°C (270 – 274°F)
	Exposure time	5 minutes

Table 2.3 Steam sterilization (autoclaving) exposure parameters

Chapter 3 Cleaning, Disinfection and Sterilization Procedures

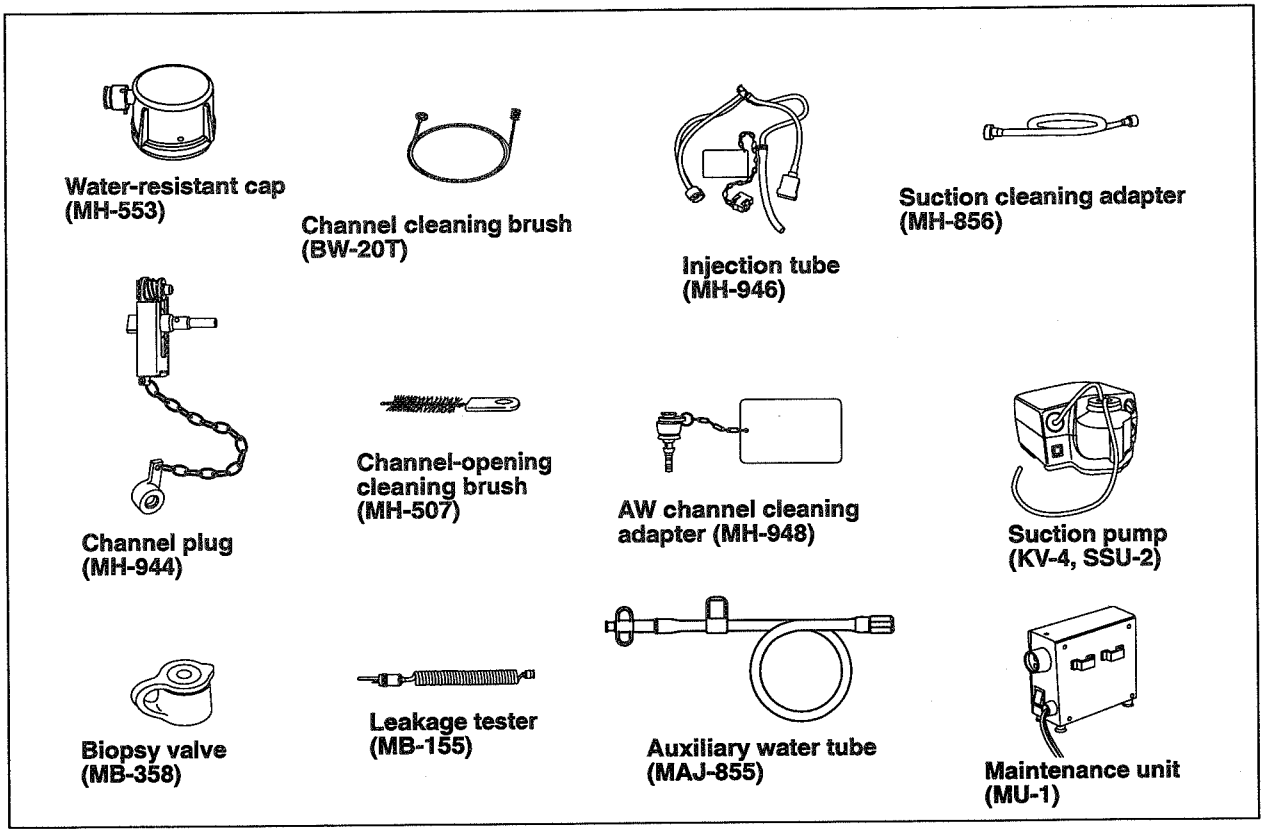
3.1 Required reprocessing equipment

Preparation of the equipment

Prior to cleaning, disinfection or sterilization, prepare the equipment shown in Figure 3.1.

CAUTION

- Use basins which are at least 40 cm by 40 cm (16" by 16") in size and deep enough to allow the endoscope to be completely immersed.
- For proper reprocessing results, do not coil the insertion tube or the universal cord with a diameter of less than 40 cm.
- Do not coil the endoscope's insertion tube or universal cord with a diameter of less than 12 cm. The endoscope can be damaged if coiled too tightly.



- Detergent solution
- Rinsing water
- 70% ethyl or isopropyl alcohol
- Disinfectant solution
- Large, non-metallic basins with tight fitting lids for detergent and disinfectant solution
- Large basins for rinsing and leakage testing
- 30 cm^3 (30 ml) syringe
- Soft brush
- Personal protective equipment
- Lint-free cloths

Figure 3.1

Reprocessing equipment parts and functions

For inspection of other equipment than that mentioned below, refer to the instruction manual for the equipment being used.

○ Water-resistant cap (MH-553)

The water-resistant cap is attached to the electrical connector on the endoscope to protect the connector from water penetration during reprocessing. For leakage testing, the venting connector on the water-resistant cap has to be connected to the leakage tester (see Figure 3.2).

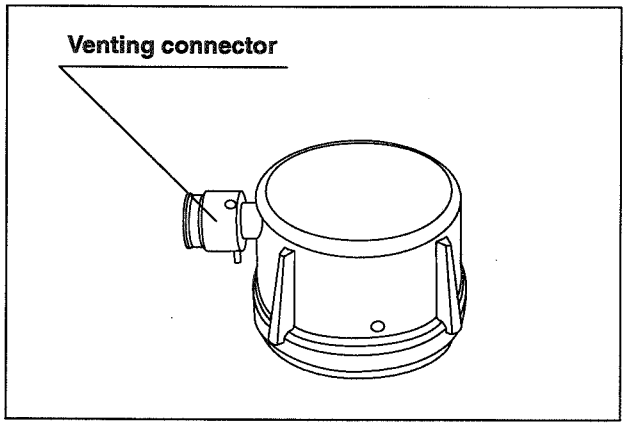


Figure 3.2

○ Channel plug (MH-944)

The channel plug is used to plug the openings of the instrument channel port, air/water and suction cylinders during cleaning (see Figure 3.3).

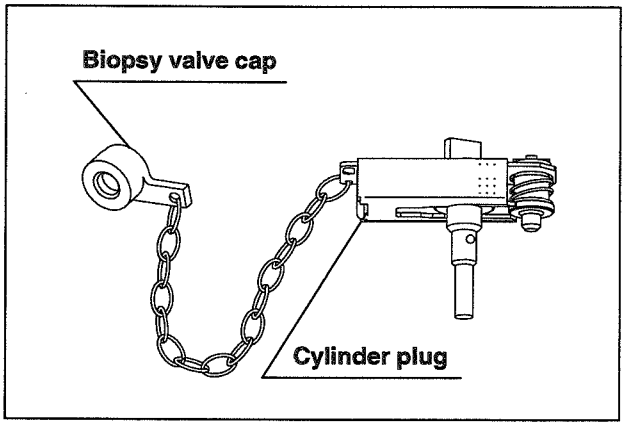


Figure 3.3

Injection tube (MH-946)

The injection tube is used to inject detergent solution, disinfectant solution, water and alcohol into the air/water and suction channels and to flush air through the channels to expel fluids (see Figure 3.4).

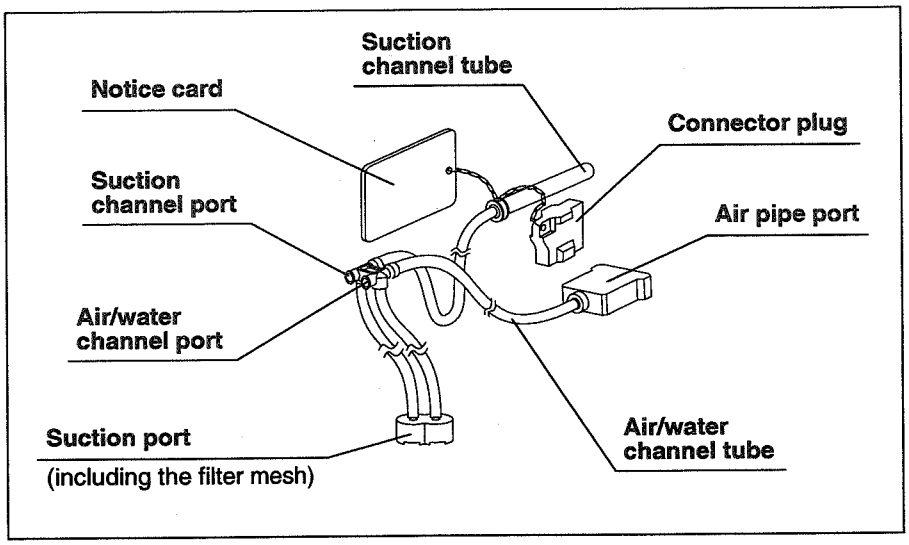


Figure 3.4

Auxiliary water tube (MAJ-855) (for endoscopes with auxiliary water feeding only)

The auxiliary water tube is used to inject detergent solution, disinfectant solution and sterile water into the auxiliary water channel and to flush air through the channel to expel fluids (see Figure 3.5).

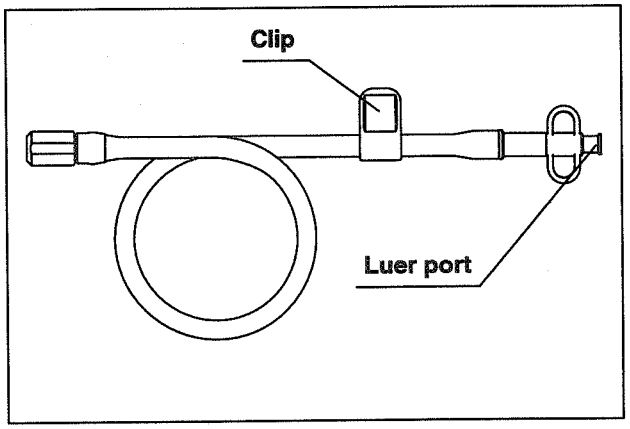


Figure 3.5

Channel cleaning brush (BW-20T)

The channel cleaning brush is used to brush the inside of the instrument/suction channels and the holes in the air/water and suction valves (see Figure 3.6).

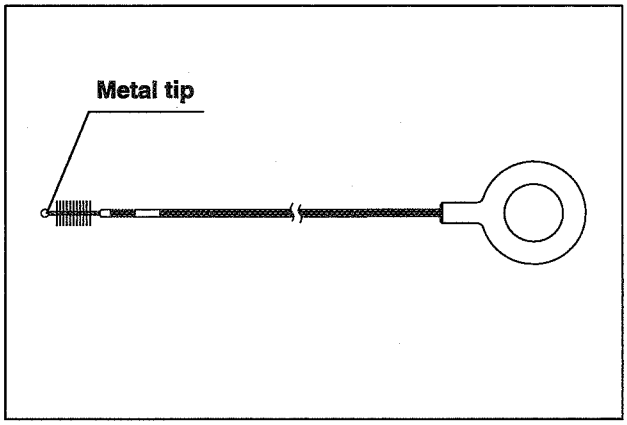


Figure 3.6

Channel-opening cleaning brush (MH-507)

The channel-opening cleaning brush is used to brush the external surface of the distal end of the endoscope, the suction cylinder and the instrument channel port (see Figure 3.7).

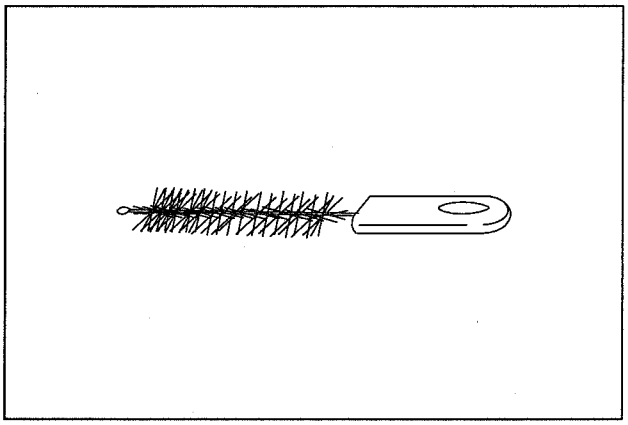


Figure 3.7

Suction cleaning adapter (MH-856)

The suction cleaning adapter is used to aspirate reprocessing fluids from the distal end of the endoscope through the instrument channel (see Figure 3.8).

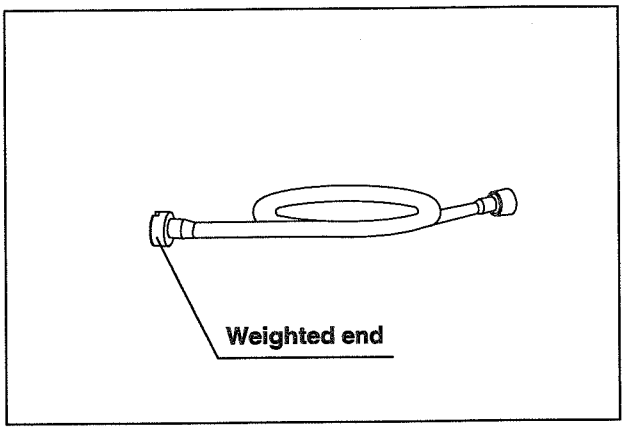


Figure 3.8

AW channel cleaning adapter (MH-948)

During precleaning, the AW channel cleaning adapter is connected to the air/water cylinder. When the adapter is depressed, water is fed through the air/water nozzle. Air is continuously fed when the adapter is not depressed (see Figure 3.9).

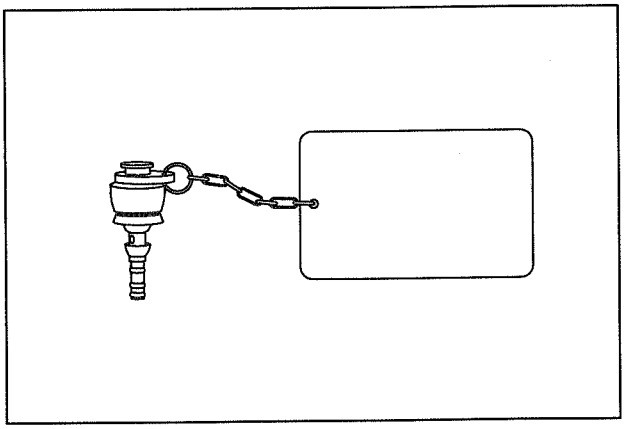


Figure 3.9

Inspection of the equipment

For inspection of other equipment than that mentioned below, refer to the instruction manual for the equipment being used.

CAUTION

The cleaning brushes are consumable items. Should the slightest irregularity be suspected, use a spare instead. Using a defective brush may cause equipment damage.

○ Inspection of the water-resistant cap

1. Confirm that the inside of the water-resistant cap is dry and free from debris (see Figure 3.2).
2. Confirm that the seal inside the water-resistant cap is free from scratches, flaws and debris.
3. Check the venting connector for looseness.

○ Inspection of the channel plug

Confirm that the cylinder plug and biopsy valve cap are free from cracks, scratches, flaws and debris (see Figure 3.3).

○ Inspection of the injection tube

1. Confirm that all components of the injection tube are free from cracks, scratches, flaws and debris (see Figure 3.4).
2. Confirm that the filter mesh is in the suction port.
3. Attach the 30 cm^3 (30 ml) syringe to the air/water channel port. With the filter mesh immersed in rinsing water, withdraw the syringe plunger and confirm that rinsing water is drawn into the syringe. Depress the plunger and confirm that rinsing water is emitted from the air pipe port. Confirm that water is not emitted from the suction port.
4. Attach the 30 cm^3 (30 ml) syringe to the suction channel port. With the filter mesh immersed in rinsing water, withdraw the syringe plunger and confirm that rinsing water is drawn into the syringe. Depress the plunger and confirm that rinsing water is emitted from the distal end of the suction channel tube. Confirm that water is not emitted from the suction port.

❍ Inspection of the auxiliary water tube for endoscopes with auxiliary water feeding only

Check for cracks, scratches, flaws, debris and other damage (see Figure 3.5).

❍ Inspection of the channel cleaning brush

1. Confirm that the brush section and the metal tip at the distal end are securely in place. Check for loose or missing bristles (see Figure 3.6).
2. Check for bends, scratches and other damage to the shaft.
3. Check for debris on the shaft and/or in the bristles of the brush.

❍ Inspection of the channel-opening cleaning brush

1. Check for loose or missing bristles (see Figure 3.7).
2. Check for debris on the shaft and/or in the bristles of the brush.

❍ Inspection of the suction cleaning adapter

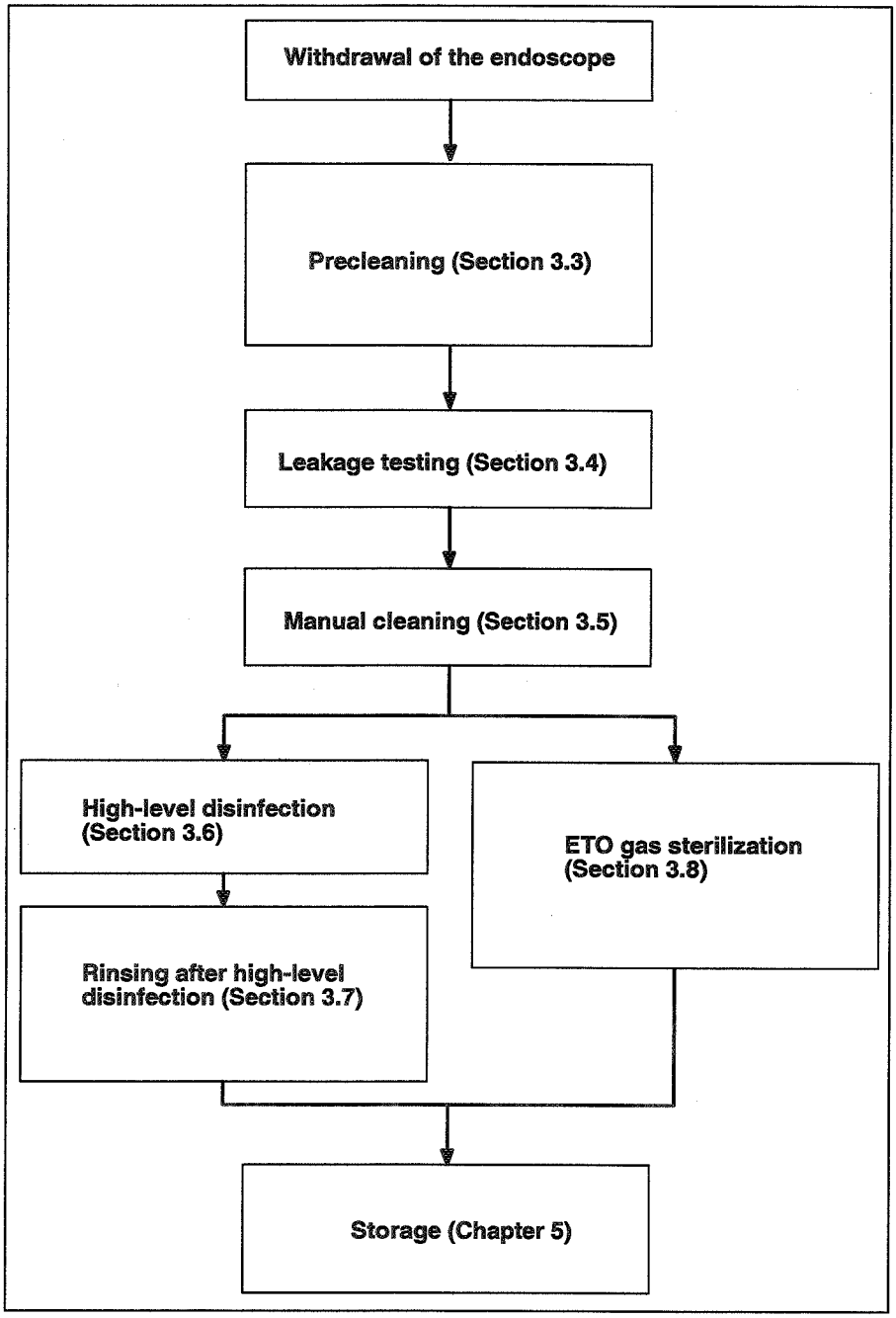
Check for cracks, scratches, flaws, debris and other damage (see Figure 3.8).

❍ Inspection of the AW channel cleaning adapter

Check for cracks, scratches, flaws, debris and other damage (see Figure 3.9).

3.2 Cleaning, disinfection and sterilization procedures

Endoscope reprocessing summary chart



3.3 Precleaning

WARNING

If the endoscope is not immediately precleaned, residual organic debris will begin to solidify and it may be difficult to effectively reprocess the endoscope.

Preclean the endoscope at the bedside in the procedure room immediately after the procedure. The following steps are to be performed when the light source and suction pump are turned ON and still connected to the endoscope.

Equipment needed

Prepare the following equipment:

- Personal protective equipment
- Clean, lint-free cloths
- 500 cm^3 (500 ml) container
- Detergent solution
- AW channel cleaning adapter (MH-948)
- Auxiliary water tube (MAJ-855)

Wipe down the insertion tube

CAUTION

Handle the insertion tube carefully. Tightly gripping or sharply bending the insertion tube or bending section can stretch or severely damage the insertion tube and the covering of the bending section.

1. Prepare detergent solution in a 500 cm^3 (500 ml) container.
2. Wipe the entire insertion tube with a clean, lint-free cloth soaked in detergent solution. Wipe from the boot at the control section toward the distal end.

Aspirate detergent solution

CAUTION

Monitor the suction bottle on the suction pump carefully to ensure that it does not overflow. Otherwise, suction pump damage could result.

1. Turn the suction pump and the light source ON.
2. Immerse the distal end of the insertion tube in detergent solution. Depress the suction valve and aspirate detergent solution into the instrument channel for 30 seconds (see Figure 3.10).
3. Remove the distal end of the insertion tube from the detergent solution. Depress the suction valve and aspirate air for 10 seconds.
4. Turn the suction pump OFF.

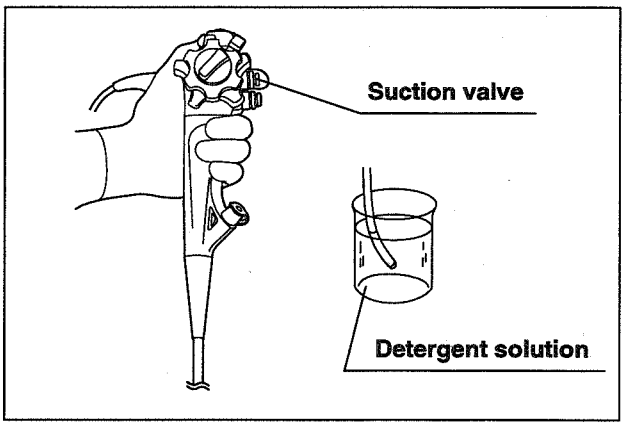


Figure 3.10

Flush water and air into the air/water channel

WARNING

Do not use the AW channel cleaning adapter for patient examinations. It will cause continuous insufflation and could result in patient injury.

CAUTION

To prevent clogging of the air/water nozzle, always use the AW channel cleaning adapter to clean the air/water channel after each use.

1. Switch "OFF" the airflow regulator on the light source.
2. Remove the air/water valve from the endoscope and place it in a container of detergent solution (see Figure 3.11).
3. Attach the AW channel cleaning adapter to the air/water cylinder of the endoscope (see Figure 3.11).

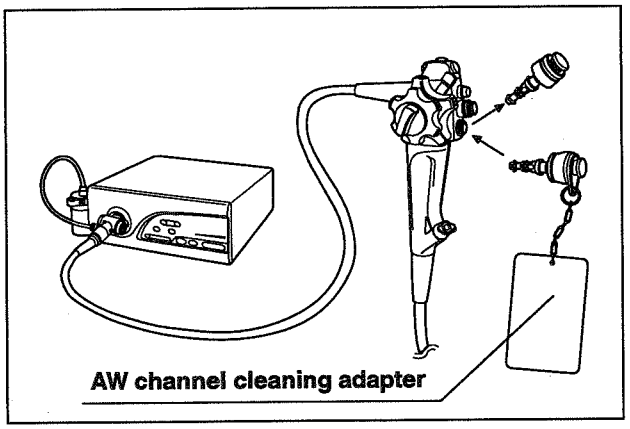


Figure 3.11

4. Switch the airflow regulator to maximum output ("HIGH" or "3").
5. Immerse the distal end of the insertion tube in water.
6. Depress the AW channel cleaning adapter to feed water through the channels for 30 seconds. Release the valve to feed air through the channels for 10 seconds or more (see Figure 3.12).

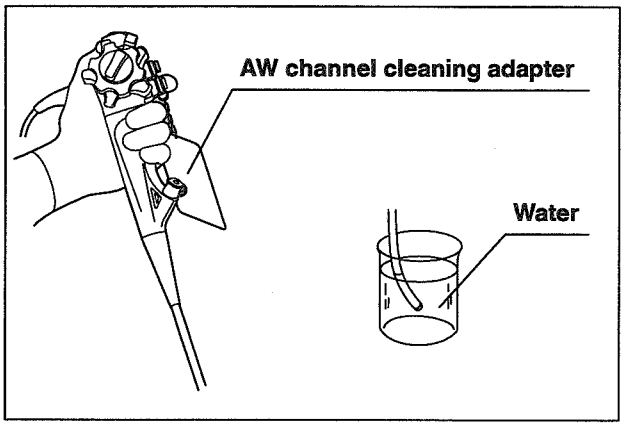


Figure 3.12

7. Turn the light source and EVIS video system center OFF.

Flush detergent solution and air into the auxiliary water channel (for endoscopes with auxiliary water feeding only)

CAUTION

- When the auxiliary water tube is not connected to the auxiliary water inlet, uncap the auxiliary water inlet cap and connect the auxiliary water tube.
- Do not cap the auxiliary water inlet cap during reprocessing.

NOTE

Prior to reprocessing endoscopes equipped with auxiliary water feeding, attach the auxiliary water inlet cap to the auxiliary water inlet and open the cap (see Figure 3.13).

1. Immerse the distal end of the insertion tube in the water.
2. Using the 30 cm^3 (30 ml) syringe, slowly flush detergent solution through the auxiliary water channel several times until no bubbles exit the distal end.
3. Using the 30 cm^3 (30 ml) syringe, slowly flush water through the auxiliary water channel several times.
4. Using the 30 cm^3 (30 ml) syringe, slowly flush air through the auxiliary water channel several times until a steady stream of bubbles exits the distal end.

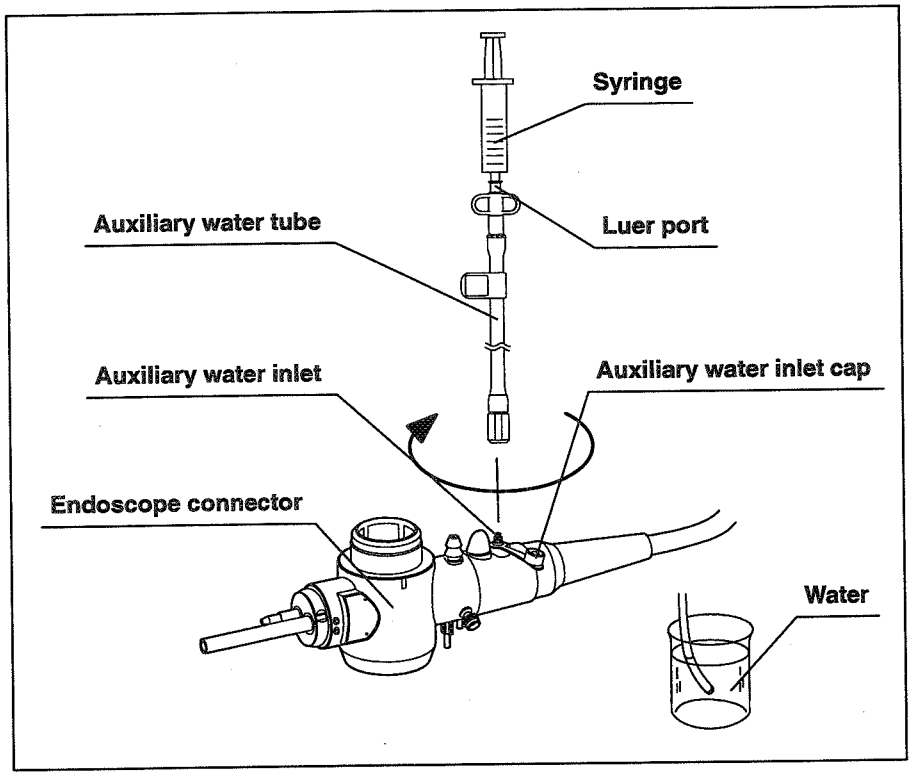


Figure 3.13

Disconnect the endoscope, reusable parts and cleaning equipment

1. Disconnect the AW channel cleaning adapter, suction valve and biopsy valve from the endoscope and place them in a container of detergent solution. Clean, disinfect and sterilize the items according to the instructions given in Section 3.9, "Cleaning, disinfection and sterilization procedures for reusable parts and reprocessing equipment".
2. Disconnect the auxiliary water tube from the endoscope and place it a container of detergent solution. Clean, disinfect and sterilize the items according to the instructions given in Section 3.9, "Cleaning, disinfection and sterilization procedures for reusable parts and reprocessing equipment" (for endoscopes with auxiliary water feeding only).
3. Disconnect the water container's water supply tube from the air/water supply connector of the endoscope connector.
4. Disconnect the suction tube from the suction connector of the endoscope connector.
5. Disconnect the videoscope cable from the endoscope's electrical connector.

6. Disconnect the endoscope connector from the light source.

WARNING

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 injury may result.

7. Transport the endoscope and the container holding the other items to the reprocessing area.

3.4 Leakage testing

After precleaning, perform leakage testing on the endoscope to ensure that it is waterproof.

Equipment needed

Prepare the following equipment:

- Personal protective equipment
- Large basin
- Water
- Maintenance unit or light source (MU-1 or CLV-160)
- Leakage tester (MB-155)
- Water-resistant cap (MH-553)

Attach the water-resistant cap

CAUTION

- The electrical connector of the endoscope is not waterproof. Before immersing or leakage testing the endoscope, always attach the water-resistant cap.
- If the exterior of the electrical connector is scratched, the connector may no longer be waterproof and the seal inside the water-resistant cap may be scratched. If the electrical connector is scratched, send it immediately to Olympus for repairs.
- Never immerse the water-resistant cap unless it is attached to the endoscope. Water remaining inside the water-resistant cap can be transferred to and damage the electrical connector.

1. Align the EW character (see Figure 3.14 a) or KC/TD character (see Figure 3.14 b) on the water-resistant cap with mark 2 on the electrical connector housing.
2. Align the pin on the electrical connector with the groove on the water-resistant cap.
3. Push the water-resistant cap into position and rotate it clockwise until it stops (approximately 45°).

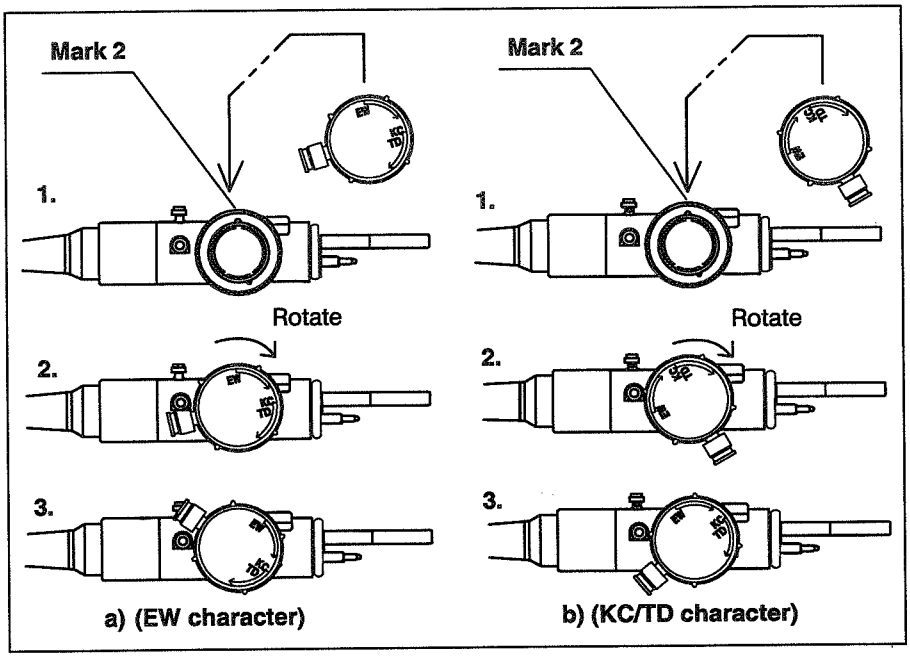


Figure 3.14

Performing the leakage test

CAUTION

- During leakage testing, a continuous series of bubbles emerging from a location on the endoscope indicates a leak at that location. This means that water will be able to penetrate the inside of the endoscope. If you locate a leak, remove the endoscope from the water and contact Olympus.
- Never connect or disconnect the water-resistant cap or the leakage tester's connector cap while immersed. Doing so could allow water to enter the endoscope and equipment damage can result.

- Rotate the leakage tester's connector cap until it stops. If it is not fully and properly attached, the endoscope's interior will not be pressurized and accurate leakage testing will be impossible.
- When attaching the leakage tester's connector cap to the water-resistant cap's venting connector, make sure that the inside of the leakage tester's connector cap and the outside of the water-resistant cap's venting connector are thoroughly wipe and dry. Water remaining on either component may penetrate the inside of the water-resistant cap and could cause endoscope malfunction.

NOTE

When the leakage tester connector is in place, the covering of the bending section will expand as the air pressure inside the endoscope increases. This is normal.

1. Fill a basin with water. Use a basin which is at least 40 cm by 40 cm (16" by 16") in size and deep enough to allow the endoscope to be completely immersed.
2. Insert the leakage tester connector into the output socket of the maintenance unit or the light source and turn the maintenance unit or the light source ON. Set the light source's airflow regulator switch to "HIGH" or "3".
3. Confirm that the leakage tester is emitting air by gently depressing the pin located inside the leakage tester's connector cap.
4. Attach the leakage tester's connector cap to the venting connector of the water-resistant cap (see Figure 3.15).

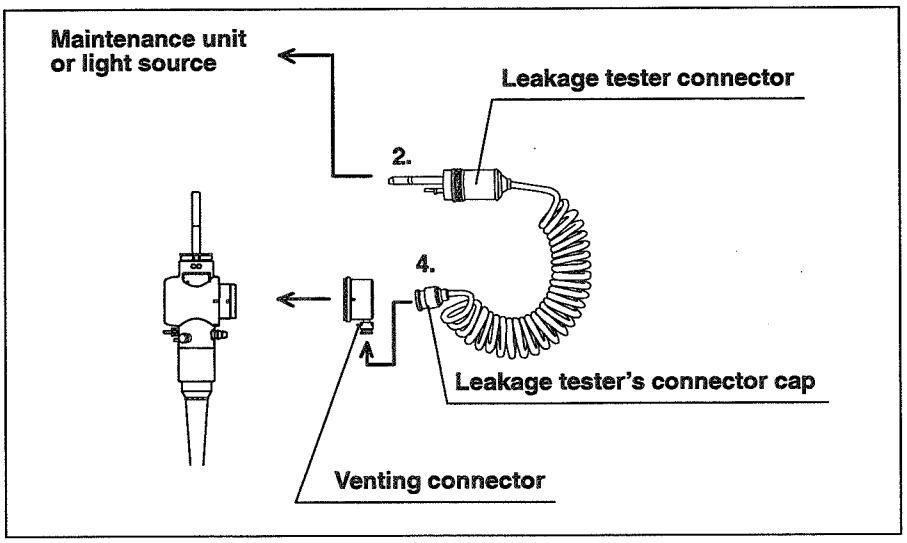


Figure 3.15

5. With the leakage tester connected, immerse the endoscope in water and observe for approximately 30 seconds while angulating the bending section. Confirm that there is no location on the endoscope from which a continuous series of bubbles emerges.

6. Remove the endoscope from the basin with the leakage tester attached.

7. Turn the maintenance unit or the light source OFF.

8. Disconnect the leakage tester from the maintenance unit or the light source.

9. Always disconnect the leakage tester connector from the light source or maintenance unit before detaching the leakage tester's connector cap from the venting connector. Detaching the leakage tester's connector cap from the venting connector while the leakage tester is still connected to the light source will not allow the endoscope to depressurize properly. This may damage the endoscope.

10. Wait 30 seconds, or until the covering of the bending section contracts to its pre-expansion size. Disconnect the leakage tester's connector cap from the venting connector.

11. Thoroughly dry the leakage tester.

3.5 Manual cleaning

After completing the leakage test, perform manual cleaning according to the procedures described below.

Equipment needed

Prepare the following equipment:

- Personal protective equipment
- Soft brush
- Clean, lint-free cloths
- Large basins
- Detergent solution
- Clean water
- Suction cleaning adapter (MH-856)
- Channel plug (MH-944)
- Injection tube (MH-946)
- Channel cleaning brush (BW-20T)
- Channel-opening cleaning brush (MH-507)
- Auxiliary water tube (MAJ-855)

CAUTION

To prevent damage to the endoscope, never immerse it together with objects other than the reprocessing accessories.

Cleaning the external surface

1. Fill a basin with water and detergent solution at the temperature and concentration recommended by the detergent manufacturer. Use a basin which is at least 40 cm by 40 cm (16" by 16") in size and deep enough to allow the endoscope to be completely immersed.
2. Immerse the endoscope in the detergent solution.
3. With the endoscope immersed, use a soft brush or lint-free cloth to thoroughly brush or wipe all external surfaces of the endoscope. Pay particular attention to the air/water nozzle opening and ensure that all surfaces of the distal end are cleaned thoroughly (see Figure 3.16).

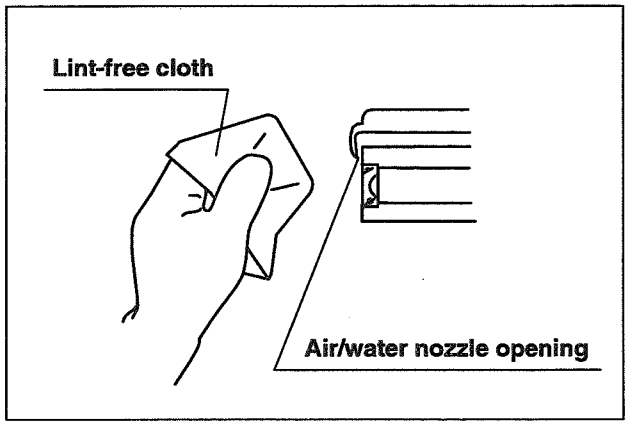


Figure 3.16

Brushing the channels

WARNING

- To avoid splattering detergent solution when the channel cleaning brush is pulled out, keep the endoscope submerged.
- The channel cleaning brush is an item that is subject to wear. Repeated using may cause the brush head being bent or kinked, as a result the brush head may be come off. Confirm that the brush is free from any damages or other irregularities before and after each use. If the brush head comes off after brushing, immediately retrieve it and carefully check that it is not left inside the channel of the endoscope by passing a new cleaning brush or other endo-therapy accessories. If the brush head is left in the channel, it can drop into the patient body during the procedure. Depending on the staying location, the missing part may not be recoverable by passing a new brush or other endo-therapy accessories. In this case, contact Olympus.

CAUTION

Withdraw the channel cleaning brush from the suction channel gently, ensuring its shaft does not rub against the external opening of the suction cylinder, as this may damage the brush and may wear a groove in the opening, leading to impaired suction and liquid leakage.

While the endoscope is submerged, brush the instrument and suction channels, suction cylinder and instrument channel port according to the following procedures (see Figure 3.17).

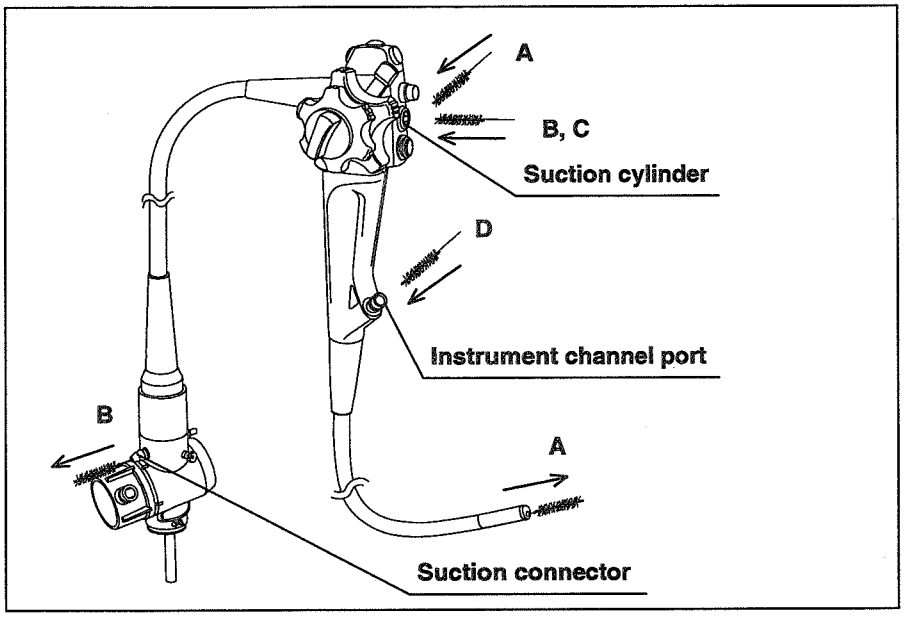


Figure 3.17

Brushing the instrument/suction channel in the insertion tube (location A)

1. Straighten the endoscope's bending section. Grip the channel cleaning brush at a point 3 cm from the bristles.
2. Insert the channel cleaning brush at a 45° angle into the opening located in the side wall of the suction cylinder as illustrated by A in Figure 3.17. Using short strokes, feed the brush through the insertion tube until it emerges from the distal end of the endoscope.
3. Clean the bristles with your fingertips in the detergent solution. Carefully pull the brush out through the channel.
4. Clean the bristles in the detergent solution again.
5. Repeat until all debris is removed.

Brushing the suction channel in the universal cord (location B)

1. Grip the channel cleaning brush at a point 3 cm from the bristles.
2. Insert the channel cleaning brush straight into the opening of the suction cylinder as illustrated by B in Figure 3.17. Using short strokes, feed the brush through the universal cord until it emerges from the suction connector on the endoscope connector.

3. Clean the bristles with your fingertips in the detergent solution. Carefully pull the brush out through the channel.
4. Clean the bristles in the detergent solution again.
5. Repeat until all debris is removed.

○ Brushing the suction cylinder (location C)

CAUTION

When inserting the channel-opening cleaning brush into the suction cylinder, do not forcibly insert the brush beyond the middle of the brush section. Otherwise, the brush may become stuck in the suction cylinder.

1. Insert the channel-opening cleaning brush into the suction cylinder as illustrated by C in Figure 3.17, until half of the brush section is inserted.
2. Turn the inserted brush once.
3. Pull the brush out and clean the bristles in the detergent solution.
4. Repeat until all debris is removed.

○ Brushing the instrument channel port (location D)

1. Insert the channel-opening cleaning brush into the instrument channel port until the brush handle touches the channel opening as illustrated by D in Figure 3.17.
2. Turn the brush once.
3. Pull the brush out and clean the bristles in the detergent solution.
4. Repeat until all debris is removed.
5. Reprocess the cleaning brushes as described in Section 3.9, "Cleaning, disinfection and sterilization procedures for reusable parts and reprocessing equipment".

Aspirating detergent solution into the suction channels

1. Attach the suction cleaning adapter to the instrument channel port (see Figures 3.18 and 3.19).
2. Connect the suction tube from the suction pump to the suction connector on the endoscope connector. Turn the suction pump ON.

3. Immerse both the endoscope's distal end and the weighted end of the suction cleaning adapter in the detergent solution.
4. Cover the suction cylinder with your finger and aspirate detergent solution for approximately 30 seconds.
5. Turn the suction pump OFF.
6. Disconnect the suction tube and the suction cleaning adapter.
7. Reprocess the suction cleaning adapter as described in Section 3.9, "Cleaning, disinfection and sterilization procedures for reusable parts and reprocessing equipment".

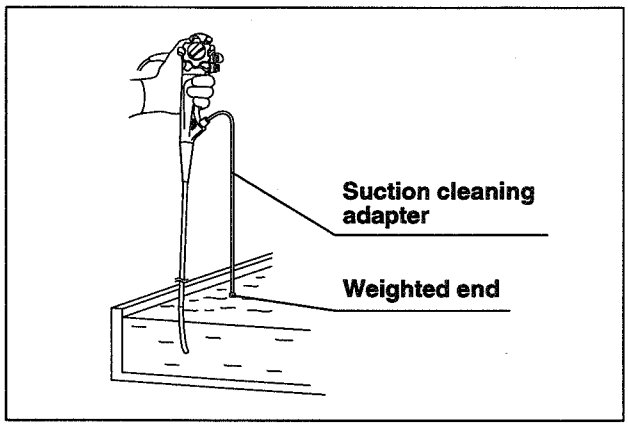


Figure 3.18

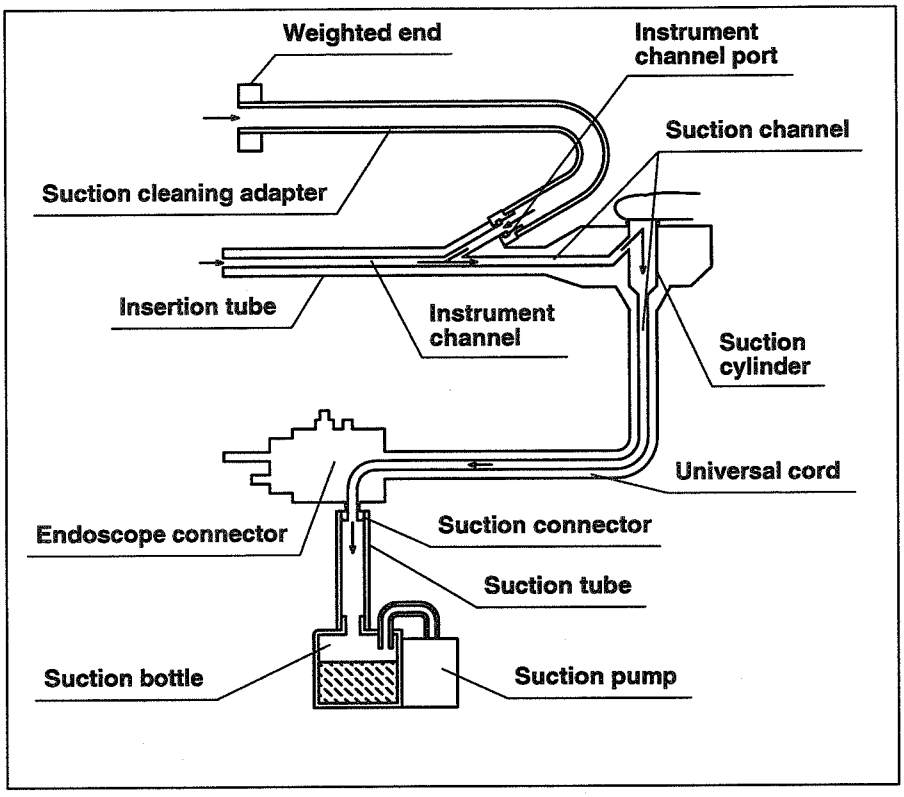


Figure 3.19

Flushing detergent solution into the air/water channels

1. Attach the channel plug's biopsy valve cap to the instrument channel port (see Figure 3.20).
2. Lower the channel plug's cylinder plug onto the air/water and suction cylinders and slide the plug until it stops (see Figure 3.20).

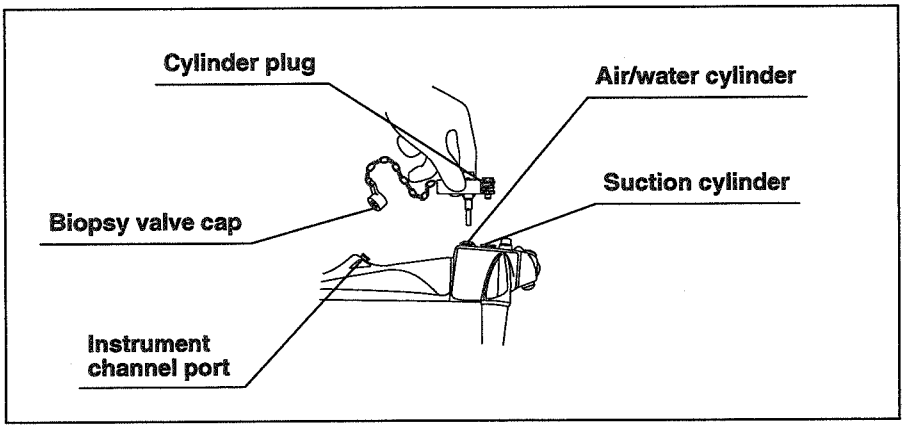


Figure 3.20

3. Attach the injection tube's connector plug to the air and water supply connectors on the endoscope connector (see Figure 3.21).

4. Attach the injection tube's air pipe port to the air pipe on the endoscope connector (see Figure 3.21).

5. Attach the injection tube's suction channel tube to the suction connector on the endoscope connector (see Figure 3.21).

6. Immerse the suction port of the injection tube in the detergent solution.

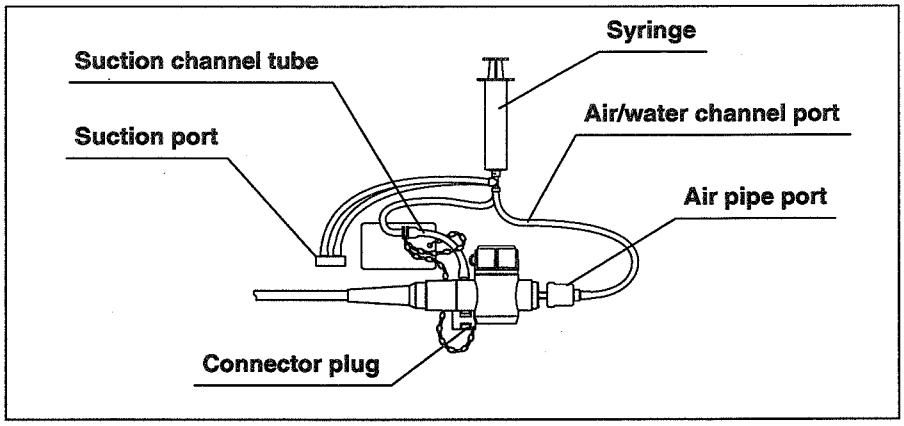


Figure 3.21

7. Attach the 30 cm^3 (30 ml) syringe to the injection tube's air/water channel port (see Figure 3.22).

8. Inject 90 cm^3 (90 ml) of detergent solution into the air/water channel.

9. Disconnect the channel plug and injection tube from the endoscope, and leave all items immersed.

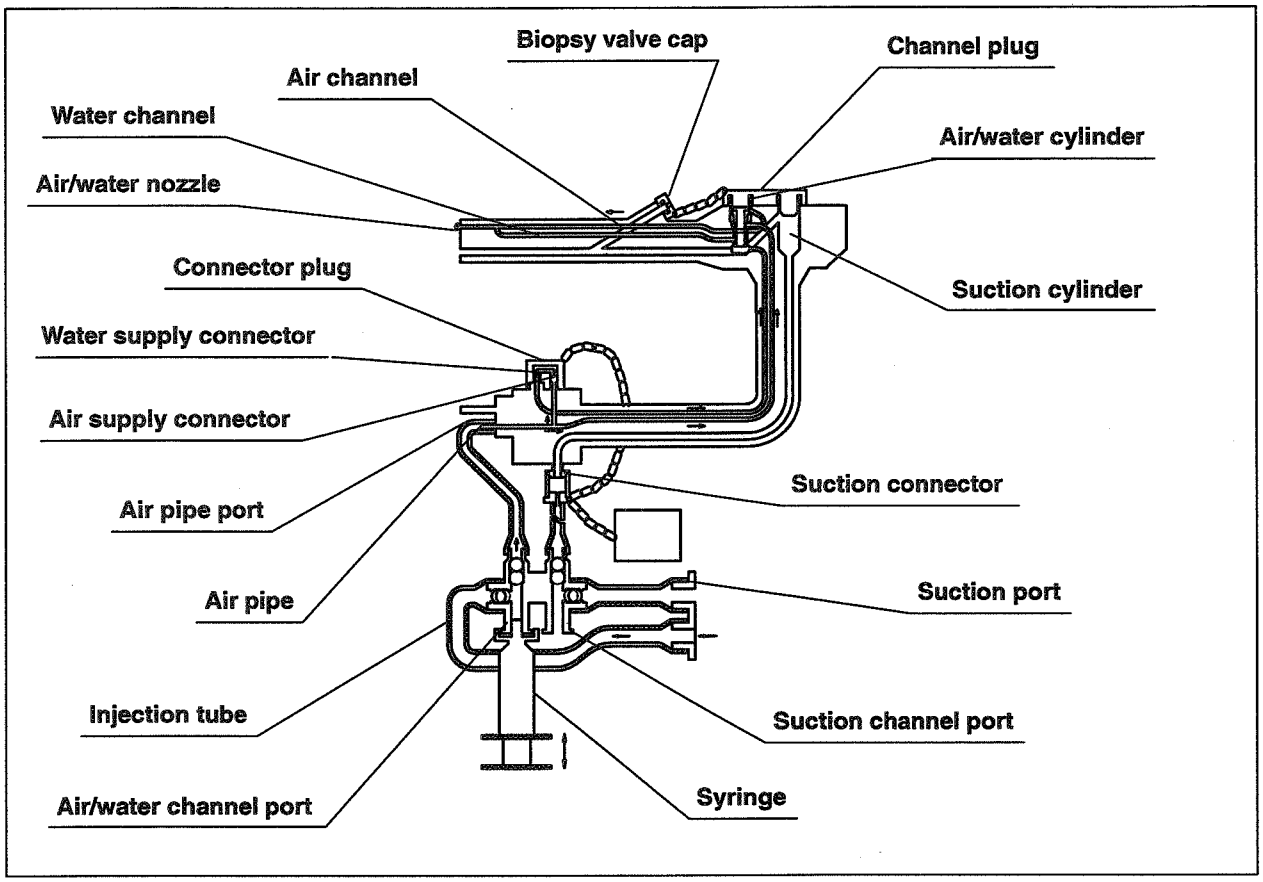


Figure 3.22

Flushing detergent solution into the auxiliary water channel (for endoscopes with auxiliary water feeding only)

Using the auxiliary water tube and 30 cm^3 (30 ml) syringe, inject detergent solution into the auxiliary water channel.

1. Attach the auxiliary water tube to the auxiliary water inlet.
2. Using the 30 cm^3 (30 ml) syringe, inject 90 cm^3 (90 ml) of detergent solution.
3. Disconnect the auxiliary water tube from the endoscope and immerse it in detergent solution.

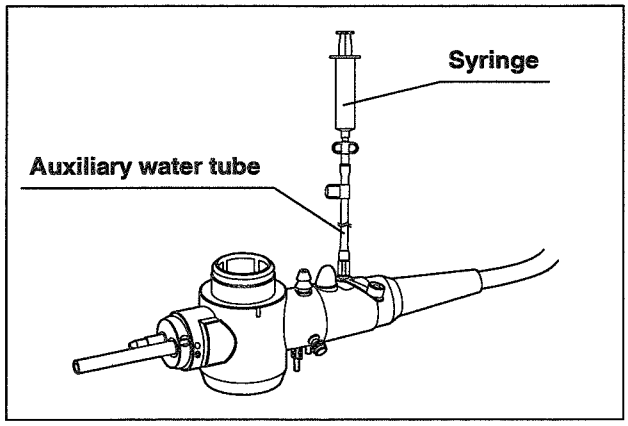


Figure 3.23

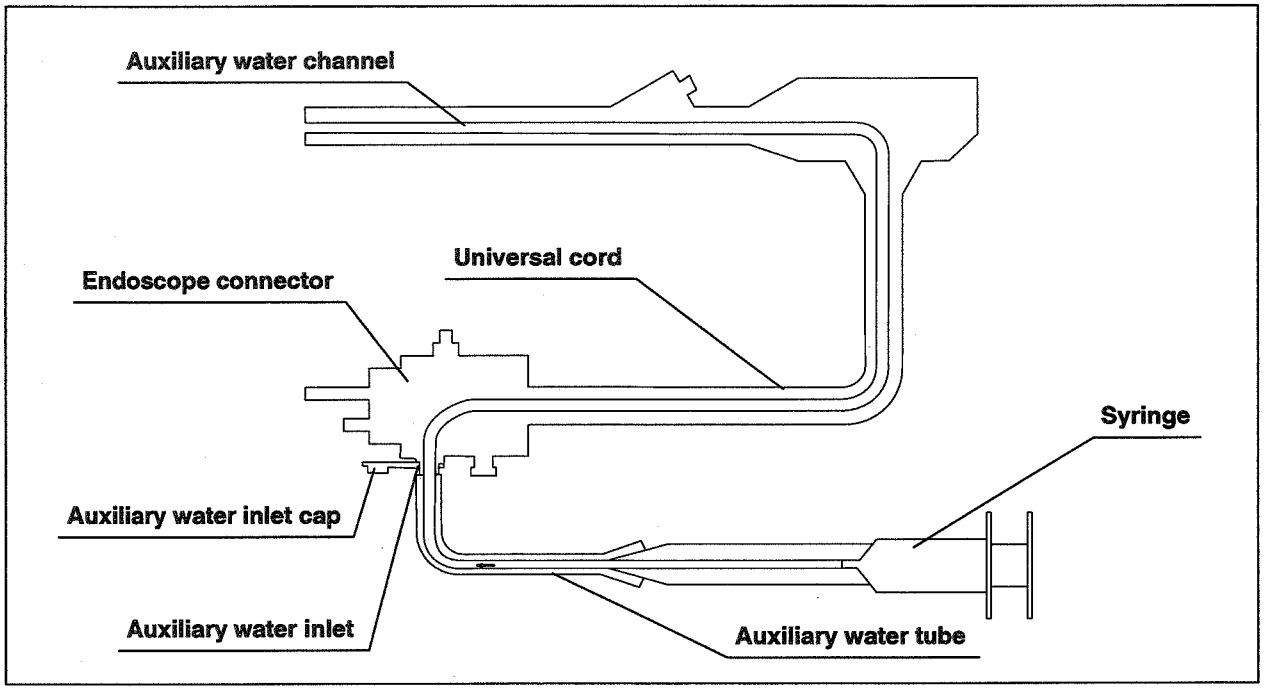


Figure 3.24

Soaking the endoscope and all equipment in detergent solution

1. Using a lint-free cloth, wipe all debris from the endoscope's external surfaces while the endoscope is immersed in the detergent solution.
2. Cover the basin with a tight fitting lid to minimize the release of detergent vapors.
3. Soak the endoscope and all equipment for the amount of time and at the temperature recommended by the detergent manufacturer.

Removing and rinsing the endoscope and all equipment

1. Remove the endoscope and all equipment from the detergent solution and place them in clean water.
2. Gently agitate them to thoroughly rinse.

Removing detergent solution from all channels

1. Connect the channel plug and the injection tube to the endoscope. Place the suction port in clean water.
2. Attach the 30 cm^3 (30 ml) syringe to the injection tube's air/water channel port and inject 90 cm^3 (90 ml) of clean water into the air/water channel (see Figure 3.22).
3. Attach the 30 cm^3 (30 ml) syringe to the suction channel port and inject 90 cm^3 (90 ml) of clean water into the suction channel (see Figure 3.25).
4. Attach the auxiliary water tube to the auxiliary water inlet (for endoscopes with auxiliary water feeding only).
5. Attach the 30 cm^3 (30 ml) syringe to the luer port of the auxiliary water tube and inject 90 cm^3 (90 ml) of clean water to the auxiliary water channel (for endoscopes with auxiliary water feeding only).
6. Remove the endoscope, together with all equipment, from the water.
7. Attach the 30 cm^3 (30 ml) syringe to the suction channel port and flush the suction channel with 90 cm^3 (90 ml) of air (see Figure 3.25).
8. Attach the 30 cm^3 (30 ml) syringe to the injection tube's air/water channel port and flush the air/water channel with 90 cm^3 (90 ml) of air (see Figure 3.22).
9. Attach the 30 cm^3 (30 ml) syringe to the luer port of auxiliary water tube and flush the auxiliary water channel with 90 cm^3 (90 ml) of air (for endoscopes with auxiliary water feeding only).
10. Detach the channel plug and injection tube from the endoscope.
11. Detach the auxiliary water tube from the endoscope (for endoscopes with auxiliary water feeding only).

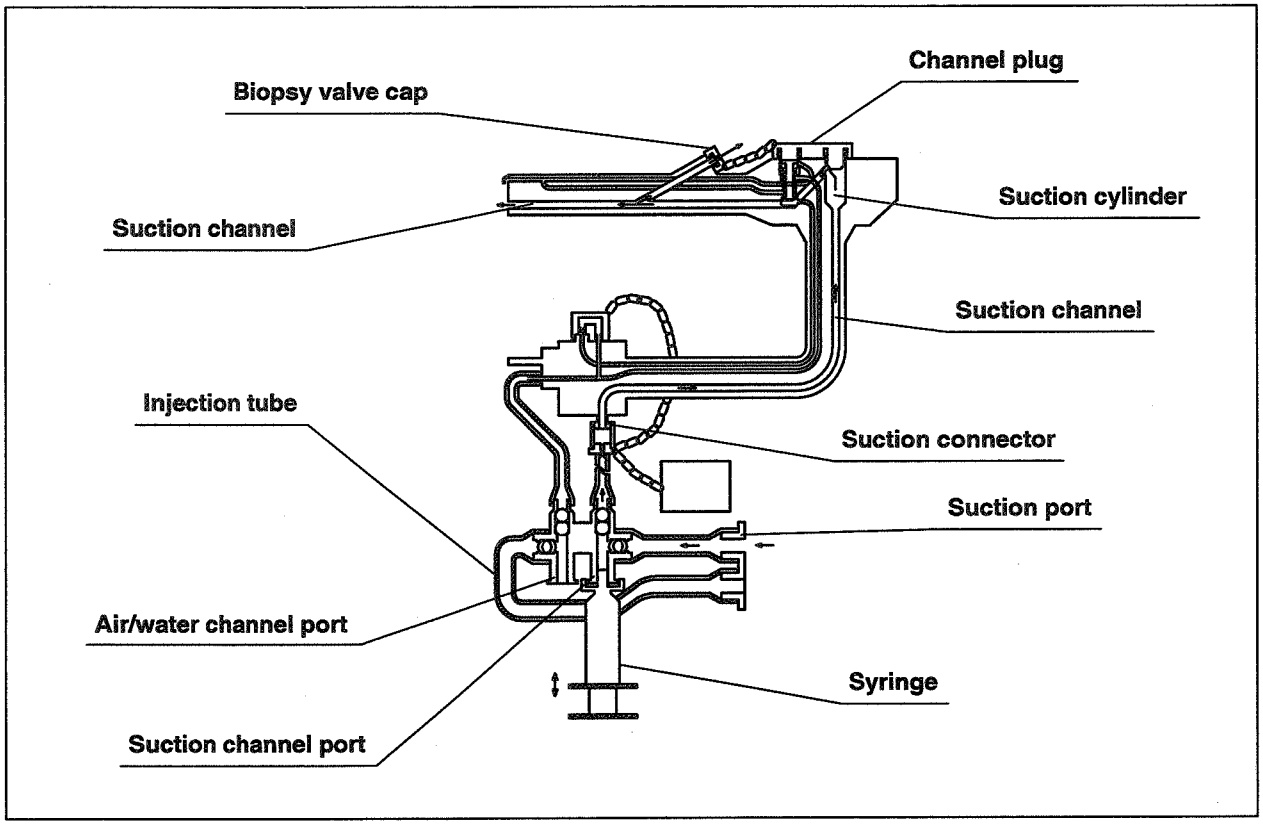


Figure 3.25

Dry external surfaces

1. Use a lint-free cloth to thoroughly wipe and dry the external surfaces of the endoscope, channel plug and injection tube.
2. Inspect the endoscope for residual debris. Should debris remain, repeat the procedures given in this section.

Presoak for excessive bleeding and/or delayed reprocessing

CAUTION

Follow the steps below only in case of excessive bleeding and/or delayed reprocessing; unnecessary immersions should be avoided. Consecutive extended immersions may damage the endoscope.

Preclean and perform a leakage test on the endoscope as described in Section 3.3, "Precleaning" and Section 3.4, "Leakage testing".

1. Fill a basin with detergent solution at the temperature and concentration recommended by the detergent manufacturer. Use a basin which is at least 40 cm by 40 cm (16" by 16") in size and deep enough to allow the endoscope to be completely immersed.
2. Carefully coil the endoscope's insertion tube and universal cord, and completely immerse the endoscope in the detergent solution.

CAUTION

Do not coil the insertion tube or universal cord with a diameter of less than 12 cm. Equipment damage can result.

3. Fill all the channels with the detergent solution following the procedures given in this section.
4. Soak the endoscope for 10 hours at the temperature recommended by the detergent manufacturer.
5. Remove the endoscope from the detergent solution.
6. After soaking the endoscope, manually clean it following the procedures given in this section, then disinfect or sterilize the endoscope following the procedures described in Section 3.6, "High-level disinfection" or Section 3.8, "Sterilization".

3.6 High-level disinfection

After manual cleaning, disinfect the endoscope according to the procedures described below.

Equipment needed

Prepare the following equipment:

- Personal protective equipment
- Clean, lint-free cloths
- Large basin
- Disinfectant solution
- Channel plug (MH-944)
- Injection tube (MH-946)
- Auxiliary water tube (MAJ-855)

WARNING

All disinfection steps should be performed with the endoscope and all equipment completely immersed. If the equipment is connected or disconnected while not immersed, disinfectant solution may not adequately contact all surfaces of the equipment. As a result, the effectiveness of disinfection may be reduced.

Preparation

1. Fill a basin with disinfectant solution at the temperature and concentration recommended by the disinfectant manufacturer. Use a basin which is at least 40 cm by 40 cm (16" by 16") in size and deep enough to allow the endoscope to be completely immersed.
2. Connect the channel plug and the injection tube to the endoscope.
3. Attach the auxiliary water tube to the auxiliary water inlet (for endoscopes with auxiliary water feeding only).

Flushing disinfectant solution into all channels

1. Immerse the endoscope and all equipment in the disinfectant solution.
2. Using the 30 cm^3 (30 ml) syringe, flush at least 90 cm^3 (90 ml) of disinfectant solution through the air/water and suction channels respectively. Confirm that no bubbles exit the distal end of the endoscope.
3. Using the 30 cm^3 (30 ml) syringe, flush at least 90 cm^3 (90 ml) of disinfectant solution through the auxiliary water channel. Confirm that no bubbles exit the distal end of the endoscope (for endoscopes with auxiliary water feeding only).
4. With the endoscope, channel plug,injection tube and auxiliary water tube completely immersed in the disinfectant solution, disconnect all equipment from the endoscope. Leave the endoscope and all equipment immersed in the disinfectant solution.

Soaking the endoscope and all equipment in disinfectant solution

1. If air bubbles adhere to the surfaces of the endoscope, channel plug, injection tube or the auxiliary water tube, remove them using a lint-free cloth.
2. Cover the basin with a tight fitting lid to minimize the release of disinfectant vapors.
3. Soak the endoscope and all equipment in disinfectant solution for the amount of time and at the temperature recommended by the disinfectant manufacturer.

Removing the endoscope and all equipment from disinfectant solution

1. Before removing the endoscope from the disinfectant solution, connect the channel plug and injection tube to the endoscope.
2. Before removing the endoscope from disinfectant solution, attach the auxiliary water tube to the endoscope (for endoscopes with auxiliary water feeding only).
3. Remove the injection tube's suction port from the disinfectant solution.
4. Attach the 30 cm^3 (30 ml) syringe to the injection tube's air/water channel port and flush the air/water channel with 90 cm^3 (90 ml) of air.

5. Attach the 30 cm^3 (30 ml) syringe to the injection tube's suction channel port and flush the suction channel with 90 cm^3 (90 ml) of air.
6. Attach the 30 cm^3 (30 ml) syringe to the luer port of the auxiliary water tube and flush the auxiliary water channel with 90 cm^3 (90 ml) of air (for endoscopes with auxiliary water feeding only).
7. Remove the endoscope and all equipment from the disinfectant solution.
8. Disconnect all equipment from the endoscope.

3.7 Rinsing after high-level disinfection

After high-level disinfection, rinse the endoscope according to the procedures described below.
Use water of appropriate microbiological quality. Once removed from disinfectant solution, the instrument must be thoroughly rinsed with sterile water to remove any disinfectant residue. If sterile water is not available, fresh potable tap water or water which has been processed (e.g. filtered) to improve its microbiological quality may be used with 70% ethyl or isopropyl alcohol rinse (see "Non-sterile water rinse and alcohol flush" on page 44). Consult with your hospital's infection control committee.

Equipment needed

Prepare the following equipment:

- Personal protective equipment
- Sterile, lint-free cloths
- Large basin
- Sterile water (or non-sterile water)
- 70% ethyl or isopropyl alcohol
- Small container
- Channel plug (MH-944)
- Injection tube (MH-946)
- Auxiliary water tube (MAJ-855)

Sterile water rinse

1. Fill a basin with sterile water. Use a basin which is at least 40 cm by 40 cm (16" by 16") in size and deep enough to allow the endoscope to be completely immersed.
2. Immerse the endoscope, channel plug, injection tube in the sterile water. Using a sterile, lint-free cloth, thoroughly rinse and wipe all external surfaces.
3. Immerse the auxiliary water tube in the sterile water. Using a sterile, lint-free cloth, thoroughly rinse and wipe all external surface (for endoscopes with auxiliary water feeding only).
4. Connect the channel plug and the injection tube to the endoscope. Place the suction port in sterile water.
5. Attach the 30 cm^3 (30 ml) syringe to the injection tube's air/water channel port and inject 90 cm^3 (90 ml) of sterile water into the air/water channel.
6. Attach the 30 cm^3 (30 ml) syringe to the suction channel port and inject 90 cm^3 (90 ml) of sterile water into the suction channel.
7. Attach the auxiliary water tube to the auxiliary water inlet (for endoscopes with auxiliary water feeding only).
8. Using the 30 cm^3 (30 ml) syringe, inject 90 cm^3 (90 ml) of sterile water into the auxiliary water channel (for endoscopes with auxiliary water feeding only).
9. Remove the endoscope, together with all equipment, from the water.
10. Using the 30 cm^3 (30 ml) syringe, flush the air/water and suction channels with 90 cm^3 (90 ml) of air.
11. Using the 30 cm^3 (30 ml) syringe, flush the auxiliary water channel with 90 cm^3 (90 ml) of air (for endoscopes with auxiliary water feeding only).
12. Disconnect the injection tube only. Connect a clean suction tube from the suction pump to the suction connector on the endoscope. Turn the suction pump ON and aspirate air for at least 15 seconds.
13. Disconnect all equipment from the endoscope.
14. Use a sterile, lint-free cloth to thoroughly wipe and dry the external surfaces of the endoscope and all equipment.

NOTE

Flushing the channels with 70% ethyl or isopropyl alcohol after rinsing them with sterile water facilitates drying inside the channels.

○ Non-sterile water rinse and alcohol flush

CAUTION

Alcohol is flammable. Handle with care.

1. Fill a small container with 70% ethyl or isopropyl alcohol.
2. Inject non-sterile water and air following the procedures given in "Sterile water rinse" on page 43.
3. Immerse the suction port of the injection tube in the alcohol. Using the 30 cm^3 (30 ml) syringe, flush the air/water and suction channels with 90 cm^3 (90 ml) of the alcohol respectively.
4. Remove the suction port of the injection tube from the alcohol. Flush the air/water and the suction channels with 90 cm^3 (90 ml) of air.
5. Using the 30 cm^3 (30 ml) syringe, flush the auxiliary water channel with 90 cm^3 (90 ml) of the alcohol (for endoscopes with auxiliary water feeding only).
6. Using the 30 cm^3 (30 ml) syringe, flush the auxiliary water channel with 90 cm^3 (90 ml) of air (for endoscopes with auxiliary water feeding only).
7. Disconnect all equipment from the endoscope.
8. Remove all equipment and the endoscope from the basin.
9. Use a sterile, lint-free cloth to thoroughly wipe and dry the external surfaces of the endoscope and all equipment.
10. Use a sterile, lint-free cloth moistened with alcohol to thoroughly wipe the external surfaces of the endoscope and all equipment.
11. Connect the channel plug and injection tube to the endoscope. Using the 30 cm^3 (30 ml) syringe, flush the air/water channel with 90 cm^3 (90 ml) of air.
12. Connect the auxiliary water tube to the endoscope. Using the 30 cm^3 (30 ml) syringe, flush the auxiliary water channel with 90 cm^3 (90 ml) of air (for endoscopes with auxiliary water feeding only).

13. Disconnect the injection tube only. Connect a clean suction tube from the suction pump to the suction connector on the endoscope and aspirate air for 15 seconds.

14. Disconnect all equipment from the endoscope.

15. Use sterile cotton swabs to dry the inside of the air/water cylinder, suction cylinder and instrument channel port.

3.8 Sterilization

ETO gas sterilization

As an alternative to high-level disinfection, the endoscope can be sterilized by ethylene oxide (ETO) gas. After performing manual cleaning and drying as described in Section 3.3, "Precleaning" and Section 3.5, "Manual cleaning", follow the procedures given below.

WARNING

Exceeding the recommended parameters may cause equipment damage.

CAUTION

If ETO gas sterilization is performed while the water-resistant cap is attached, the covering of the bending section can be damaged.

1. Remove the water-resistant cap before ETO gas sterilization (see Figure 3.26).

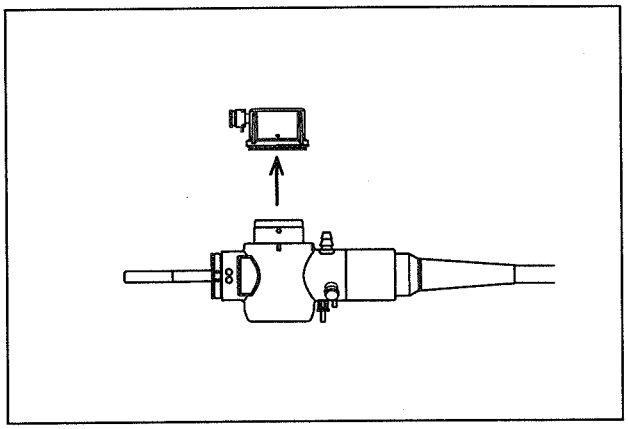


Figure 3.26

2. Seal the instrument in a package appropriate for ETO gas sterilization according to your hospital's protocol.
3. Sterilize the package according to the recommended ETO gas exposure parameters described in Section 2.5, "ETO gas sterilization" and the sterilizer manufacturer's instructions.
4. Aerate the components following the minimum aeration parameters specified in Section 2.5, "ETO gas sterilization".
5. Store the components following the instructions given in Chapter 5, "Storage".

3.9 Cleaning, disinfection and sterilization procedures for reusable parts and reprocessing equipment

This section includes the cleaning, disinfection and sterilization procedures for the reusable parts and reprocessing equipment listed below. For all other parts, refer to their respective instruction manuals. For compatible reprocessing methods, refer to Section 2.1, "Compatibility summary".

Equipment needed

- Personal protective equipment
- Soft brush
- Large basin
- Detergent solution
- Clean water
- Clean, lint-free cloths
- Disinfectant solution
- Sterile water (or non-sterile water)
- Sterile, lint-free cloths
- Small container
- 70% ethyl or isopropyl alcohol

○ Reusable parts which are normally reprocessed with the endoscope

• Channel plug	(MH-944)
• Injection tube	(MH-946)
• Water resistant cap	(MH-553)

○ Reusable parts which are normally reprocessed separately from the endoscope

- Air/water valve (MH-438)
- Suction valve (MH-443)
- Biopsy valve (MB-358)
- Mouthpiece (MA-474, MB-142)
- AW channel cleaning adapter (MH-948)
- Suction cleaning adapter (MH-856)
- Channel cleaning brush (BW-20T)
- Channel-opening cleaning brush (MH-507)
- Auxiliary water tube (MAJ-855)

Manual cleaning

CAUTION

- Make sure that the items immersed in detergent solution do not contact one another.
- Make sure not to scratch the seals on the air/water valve and AW channel cleaning adapter with brushes, etc.

1. Fill a basin with clean water and low-foaming detergent solution at the temperature and concentration recommended by the detergent manufacturer. Use a basin which is deep enough to allow all equipment to be completely immersed.
2. Immerse all equipment in the detergent solution. For the biopsy valve, remove the cap from the body before immersion. Using a clean, soft brush or lint-free cloth, meticulously clean all external surfaces in detergent solution.
3. Clean the bristles of the cleaning brushes thoroughly while the brushes are immersed.
4. While immersed, depress and release the pistons of the air/water valve, suction valve and AW channel cleaning adapter.
5. Using the channel cleaning brush, thoroughly brush the openings of the suction valve, air/water valve and biopsy valve until no debris can be seen. Clean the bristles of the brush while it is immersed in the detergent solution.

6. To clean the suction cleaning adapter, attach the 30 cm^3 (30 ml) syringe and flush the tube thoroughly with detergent solution.

7. To clean the auxiliary water tube, attach the 30 cm^3 (30 ml) syringe to the luer port of the auxiliary water tube and flush the tube thoroughly with detergent solution (for endoscopes with auxiliary water feeding only).

8. Soak all equipment for the amount of time and at the temperature recommended by the detergent manufacturer.

9. Remove all equipment from the detergent solution and place it in clean water.

10. Inspect all equipment. If debris remains, ultrasonically clean at 38 – 47 kHz for 5 minutes.

11. While immersed, depress and release the pistons of the air/water valve, suction valve and AW channel cleaning adapter.

12. Attach the 30 cm^3 (30 ml) syringe to the suction cleaning adapter and flush the tube with clean water.

13. Attach the 30 cm^3 (30 ml) syringe to the luer port of the auxiliary water tube and flush the tube with water (for endoscopes with auxiliary water feeding only).

14. Remove all equipment from the clean water.

15. Attach the 30 cm^3 (30 ml) syringe to the suction cleaning adapter and flush air to remove the clean water.

16. Attach the 30 cm^3 (30 ml) syringe to the luer port of the auxiliary water tube and flush air to remove the water (for endoscopes with auxiliary water feeding only).

17. Use a clean, lint-free cloth to thoroughly wipe and dry the external surfaces of all equipment.

High-level disinfection

1. Fill a basin with disinfectant solution at the temperature and concentration recommended by the disinfectant manufacturer. Use a basin which is deep enough to allow all equipment to be completely immersed.
2. Immerse all equipment in the disinfectant solution.
3. While immersed, depress and release the pistons of the valves and AW channel cleaning adapter.
4. Attach the 30 cm^3 (30 ml) syringe to the suction cleaning adapter and flush the tube with disinfectant solution. Ensure that all air bubbles are expelled.
5. Attach the 30 cm^3 (30 ml) syringe to the luer port of the auxiliary water tube and flush the tube with disinfectant solution. Ensure that all air bubbles are expelled (for endoscopes with auxiliary water feeding only).
6. Using a lint-free cloth or 30 cm^3 (30 ml) syringe, wipe and/or flush all surfaces with the disinfectant solution to remove all air bubbles.
7. Rub the bristles of the cleaning brushes to remove all air bubbles.
8. Soak all equipment for the amount of time and at the temperature recommended by the disinfectant manufacturer.

Rinsing after high-level disinfection

After high-level disinfection, rinse all equipment according to the procedures described below.
Use water of appropriate microbiological quality. Once removed from disinfectant solution, the instrument must be thoroughly rinsed with sterile water to remove any disinfectant residue. If sterile water is not available, fresh potable tap water or water which has been processed (e.g. filtered) to improve its microbiological quality may be used with 70% ethyl or isopropyl alcohol rinse (see "Non-sterile water rinse and alcohol flush" on page 51). Consult with your hospital's infection control committee.

Sterile water rinse

1. Fill a basin with sterile water. Use a basin which is deep enough to allow all equipment to be completely immersed.
2. Remove the suction cleaning adapter from the disinfectant solution and attach the 30 cm^3 (30 ml) syringe. Flush air to expel all disinfectant solution. Immerse the suction cleaning adapter in the sterile water.
3. Remove the auxiliary water tube from the disinfectant solution and attach the 30 cm^3 (30 ml) syringe. Flush air to expel all disinfectant solution. Immerse the auxiliary water tube in the sterile water (for endoscopes with auxiliary water feeding only).
4. Remove the remaining equipment from the disinfectant solution and immerse it in the sterile water.
5. While immersed, depress and release the pistons of the air/water valve, suction valve and AW channel cleaning adapter.
6. Attach the 30 cm^3 (30 ml) syringe to the suction cleaning adapter and flush the tube with sterile water.
7. Attach the 30 cm^3 (30 ml) syringe to the luer port of the auxiliary water tube and flush the tube with sterile water (for endoscopes with auxiliary water feeding only).
8. Gently agitate all equipment to thoroughly rinse them.
9. Remove all equipment from the sterile water.
10. Attach the 30 cm^3 (30 ml) syringe to the suction cleaning adapter and flush air to dry the inside of the tube.
11. Attach the 30 cm^3 (30 ml) syringe to the luer port of the auxiliary water tube and flush air to dry the inside of the tube (for endoscopes with auxiliary water feeding only).
12. Use a sterile, lint-free cloth to thoroughly wipe and dry all external surfaces.

NOTE

Flushing the channels with 70% ethyl or isopropyl alcohol after rinsing them with sterile water facilitates drying inside the channels.

○ Non-sterile water rinse and alcohol flush

CAUTION

Alcohol is flammable. Handle with care.

1. Fill a small container with 70% ethyl or isopropyl alcohol.
2. Inject non-sterile water and air following the procedures given in "Sterile water rinse" on page 50.
3. Attach the 30 cm^3 (30 ml) syringe to the suction cleaning adapter and flush the tube with alcohol.
4. Attach the 30 cm^3 (30 ml) syringe to the luer port of the auxiliary water tube and flush the tube with alcohol (for endoscopes with auxiliary water feeding only).
5. Immerse all equipment in the alcohol and gently agitate them.
6. While immersed, depress and release the pistons of the air/water valve, suction valve and AW channel cleaning adapter.
7. Remove all equipment from the alcohol.
8. Attach the 30 cm^3 (30 ml) syringe to the suction cleaning adapter and flush air to dry the inside of the tube.
9. Attach the 30 cm^3 (30 ml) syringe to the luer port of the auxiliary water tube and flush air to dry the inside of the tube (for endoscopes with auxiliary water feeding only).
10. Use a sterile, lint-free cloth to thoroughly wipe and dry all external surfaces.

Sterilization

ETO gas sterilization

CAUTION

The cleaning brushes are not compatible with ETO gas sterilization.

After cleaning and drying as described in "Manual cleaning" on page 47, follow the procedures given below.

1. Seal the individual parts or equipment separately in packages appropriate for ETO gas sterilization according to your hospital's protocol.
2. Sterilize the packages according to the recommended ETO gas exposure parameters as described in Section 2.5, "ETO gas sterilization" and the sterilizer manufacturer's instructions.
3. Aerate the components following the minimum aeration parameters specified in Section 2.5, "ETO gas sterilization".
4. Store the components following the instructions given in Chapter 5, "Storage".

Steam sterilization (autoclaving)

After cleaning as described in "Manual cleaning" on page 47, steam sterilize (autoclave) according to the procedures given below.

1. Seal the individual parts or equipment separately in packages appropriate for steam sterilization (autoclaving) according to your hospital's protocol.
2. Steam sterilize the packages according to the recommended steam sterilization (autoclaving) exposure parameters as described in Section 2.6, "Steam sterilization (autoclaving) of accessories" and the sterilizer manufacturer's instructions.
3. Following steam sterilization (autoclaving), let all components gradually cool down to room temperature. Sudden changes in temperature may damage the instruments.

Chapter 4 Cleaning and Disinfection Equipment

The endoscope is compatible with some endoscope washers recommended by Olympus. Refer to the respective instruction manual for details on operation.

Chapter 5 Storage

CAUTION

- The storage cabinet must be clean, dry, well ventilated and maintained at ambient temperature. Storing the endoscope in direct sunlight, at high temperatures, in high humidity or exposed to X-rays may damage the endoscope or present an infection control risk.
- Prior to storage, detach all removable parts from the endoscope. It will allow air to circulate through the internal lumens of the endoscope and will assist drying.
- Prior to storage, uncap the auxiliary water inlet cap from the auxiliary water inlet. Uncapping the auxiliary water inlet cap will allow air to circulate through the internal lumen of the endoscope and will assist drying. (for endoscopes with auxiliary water feeding only)
- Do not store the endoscope in the carrying case. Use the carrying case only for shipping the endoscope. Routinely storing the endoscope in a humid, non-ventilated environment such as the carrying case may present an infection control risk.
- When storing an endoscope that has flexibility adjustment mechanism, make sure that the insertion tube is set to the maximum flexibility (indicated by the "●" mark on the flexibility adjustment ring). If the endoscope is stored while the insertion tube is too rigid, the endoscope may be damaged.

1. Before storage of a high-level disinfected endoscope, thoroughly dry all parts of the endoscope (especially all internal lumens, the distal end, lenses and electrical contacts) and all accessories.
2. Use a cotton swab moistened with 70% ethyl or isopropyl alcohol to carefully wipe the lenses at the distal end.
3. If the endoscope has the flexibility adjustment mechanism, make sure that the Insertion tube is set to the maximum flexibility by aligning the "●" mark on the flexibility adjustment ring with the "▮" mark at the bottom of the grip section.
4. Turn the endoscope's angulation locks to the "F▶" position.

5. Hang the endoscope in the storage cabinet with the distal end hanging freely. Make sure that the insertion tube hangs vertically and as straight as possible.

OLYMPUS®

INSTRUCTIONS

EVIS EXERA GASTROINTESTINAL VIDEOSCOPE

OLYMPUS GIF TYPE **XP160**
OLYMPUS GIF TYPE **160**
OLYMPUS GIF TYPE **Q160**

EVIS EXERA COLONOVIDEOSCOPE

OLYMPUS CF TYPE **Q160L/I**
OLYMPUS CF TYPE **Q160AL/I**
OLYMPUS PCF TYPE **160AL/I**

EVIS EXERA SIGMOIDOVIDEOSCOPE

OLYMPUS CF TYPE **Q160S**

OPERATION MANUAL

Refer to the endoscope's companion manual, the "OLYMPUS GIF/CF/PCF TYPE 160 Series ENDOSCOPE REPROCESSING MANUAL" for reprocessing information.

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

Symbols

The meaning(s) of the symbol(s) shown on the package and/or this instrument are as follows:

Refer to instructions.

Endoscope

TYPE BF applied part

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 a biopsy forceps and other ancillary equipment.

Use the EVIS EXERA GASTROINTESTINAL VIDEOSCOPE GIF-XP160/160/Q160 for endoscopy and endoscopic surgery within the upper digestive tract (including the esophagus, stomach and duodenum).

Use the EVIS EXERA COLONOVIDEOSCOPE CF-Q160L/I, CF-Q160AL/I, PCF-160AL/I for endoscopy and endoscopic surgery within the lower digestive tract (including the anus, rectum, sigmoid colon, colon and ileocecal valve).

Use the EVIS EXERA SIGMOIDOVIDEOSCOPE CF-Q160S for endoscopy and endoscopic surgery within the lower digestive tract (including the anus, rectum and sigmoid colon).

Do not use these instruments for any purpose other than their intended uses.

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 "OLYMPUS GIF/CF/PCF TYPE 160 Series ENDOSCOPE REPROCESSING MANUAL" which 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.

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 injury or equipment damage.

Reprocessing and storage

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 "OLYMPUS GIF/CF/PCF TYPE 160 Series ENDOSCOPE REPROCESSING MANUAL".

After using this instrument, reprocess and store it according to the instructions given in the endoscope's respective 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 user injury and/or equipment damage can result.
Some problems that appear to be malfunctions may be correctable by referring to Chapter 5, "Troubleshooting". If the problem cannot be resolved using the information in Chapter 5, contact Olympus.

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 insert or withdraw the endoscope's insertion tube while the bending section is locked in position. Patient injury can result.
- Never perform flexibility adjustment, perform angulation control, feed air, perform suction or insert/withdraw the endoscope's insertion tube without viewing the endoscopic image. Patient injury can result.
- Never perform flexibility adjustment, operate the bending section, feed air or perform suction, insert or withdraw the endoscope's insertion tube 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 injury can result.

- Regardless of the flexibility of the endoscope's insertion tube, never insert/withdraw the insertion tube with excessive force or while an optimum field of view cannot be obtained. Otherwise, patient injury could result.

CAUTION

- Do not pull the universal cord. 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 touch the electrical contacts inside the electrical connector. CCD damage may 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.
- Turn the EVIS 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.
- The endoscope's remote switches cannot be removed from the control section. Pressing or pulling them with excessive force can break the switches.
- If remote switch 1 does not return to the OFF position after being pressed strongly from the side, gently pull the switch upwards to return it to the OFF position.
- 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.
- 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 damaged, contact Olympus.

NOTE

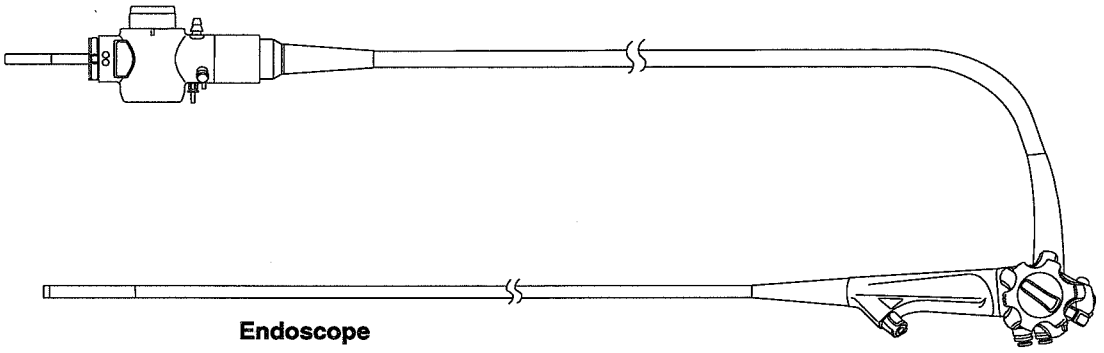
It is highly desirable that a backup endoscope be available to continue clinical procedures in case of a malfunction.

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.

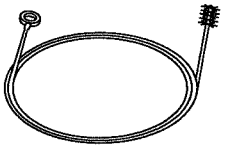
- Over-insufflating the lumen may cause patient pain and/or perforation.
- Using improperly or incompletely reprocessed or stored instruments may cause patient cross-contamination and infection.
- Applying prolonged suction with the distal tip in contact with the mucosal surface may cause bleeding or suction lesions.
- Retroflexing the endoscope within the esophagus or duodenal bulb may cause mucosal trauma or impaction of the endoscope (for GIF models only).
- Inserting and using endo-therapy accessories without a clear endoscopic image may cause burns or perforation.
- Patient injury may be caused by:
  - inserting or withdrawing the endoscope, feeding air or applying suction without a clear endoscopic image
  - withdrawing the endoscope with the angulation controls locked
  - forcefully pulling, twisting or rotating the angulated bending section

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 "OLYMPUS GIF/CF/PCF TYPE 160 Series ENDOSCOPE REPROCESSING MANUAL".



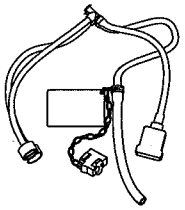
Endoscope



Channel cleaning brush (BW-20T)

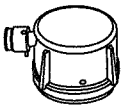
Mouthpiece (MB-142 for GIF-160 and GIF-Q160, 2 pcs)

Mouthpiece (MA-474 and MB-142 for GIF-XP160, 1 pcs each)

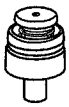


Injection tube (MH-946)

Biopsy valve (MB-358, 10 pcs)



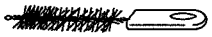
Water-resistant cap (MH-553)



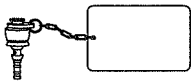
Suction valve (MH-443, 2 pcs)

Air/water valve (MH-438, 2 pcs)

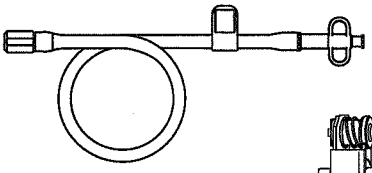
Suction cleaning adapter (MH-856)



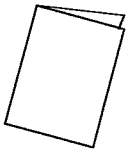
Channel-opening cleaning brush (MH-507)



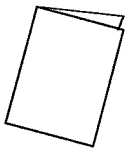
AW channel cleaning adapter (MH-948)



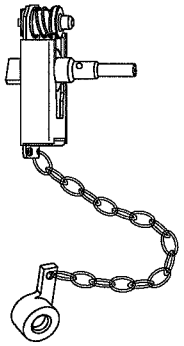
Auxiliary water tube (MAJ-855 for CF models only)



Operation manual



Reprocessing manual

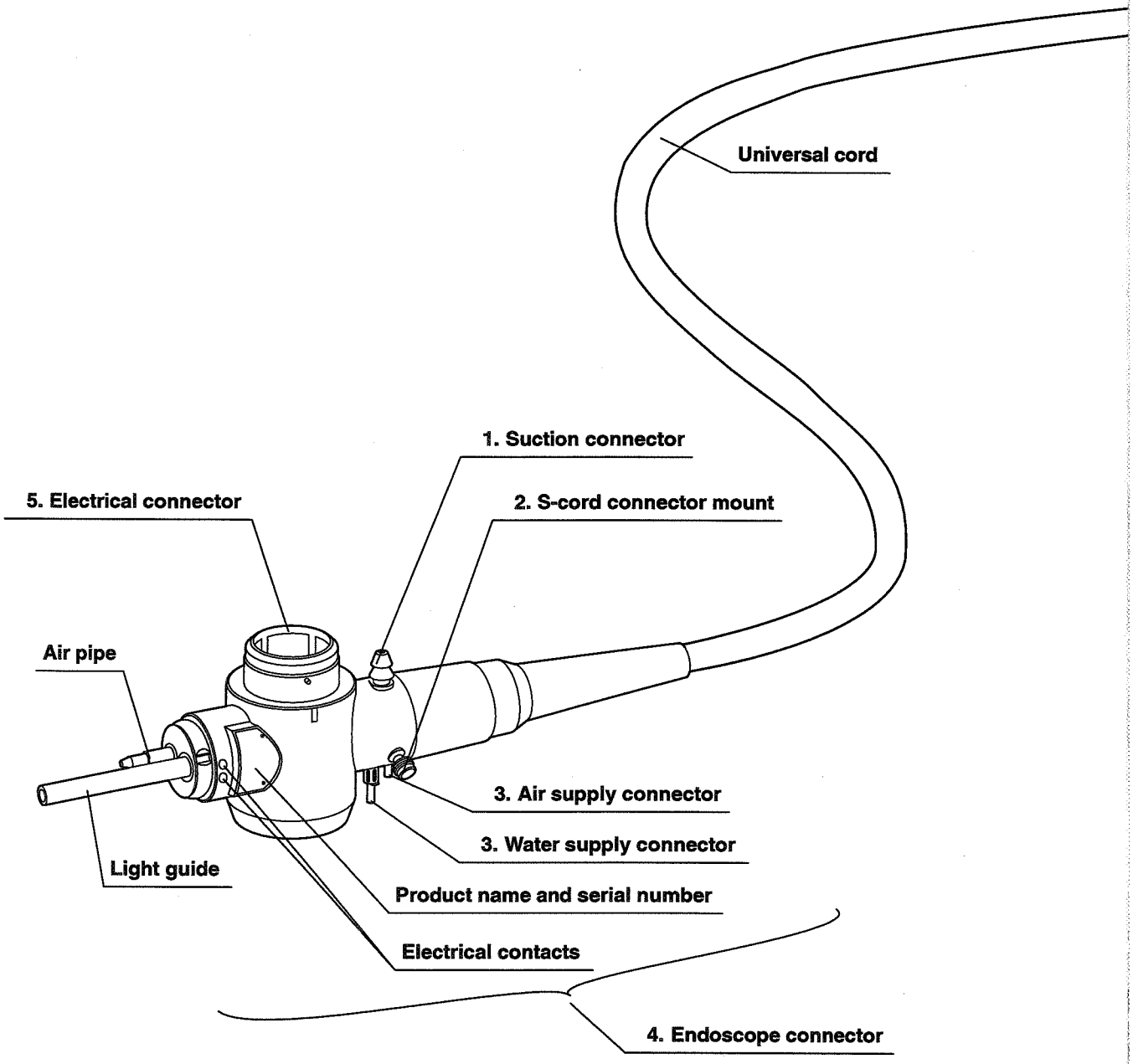


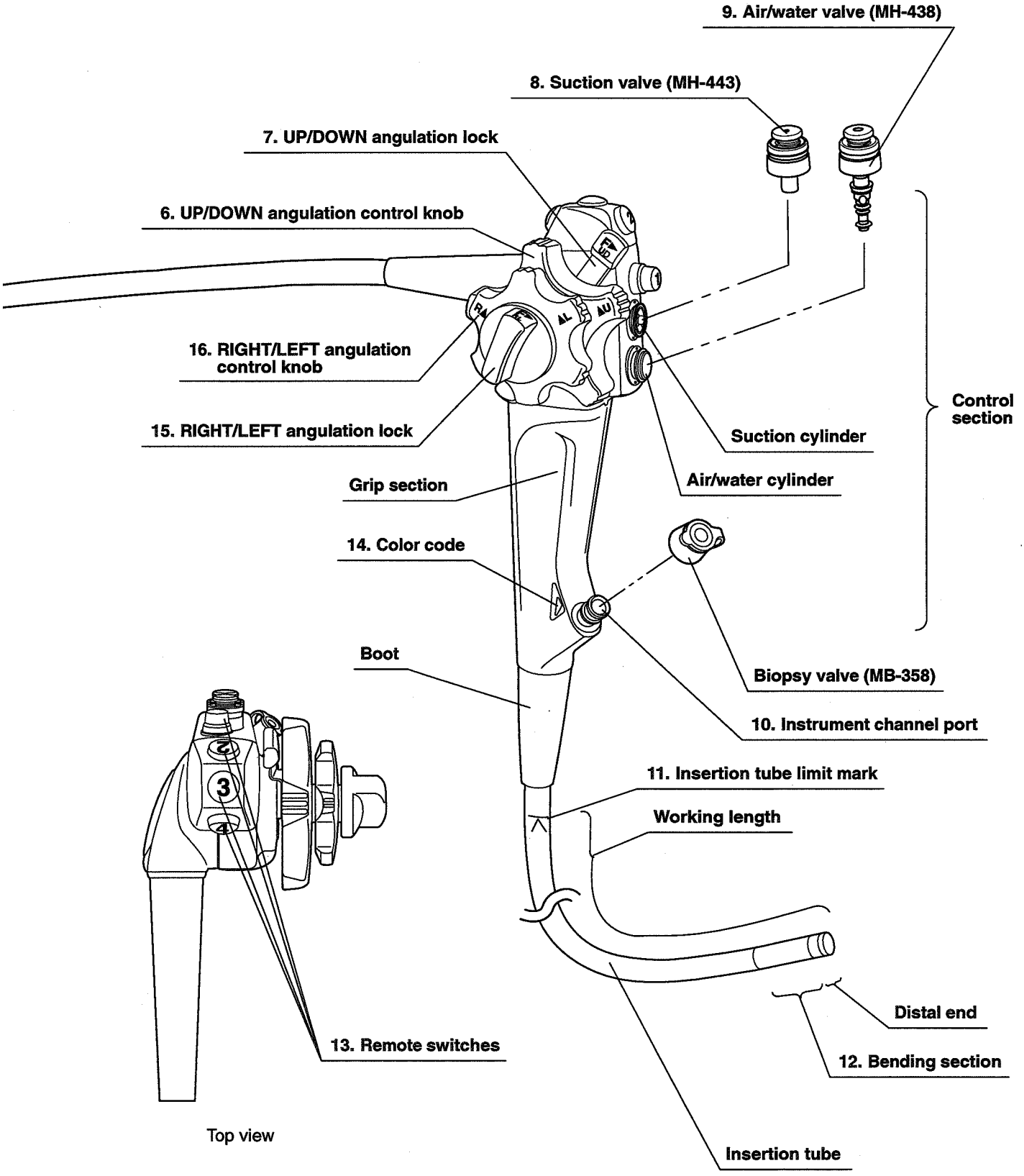
Channel plug (MH-944)

Chapter 2 Instrument Nomenclature and Specifications

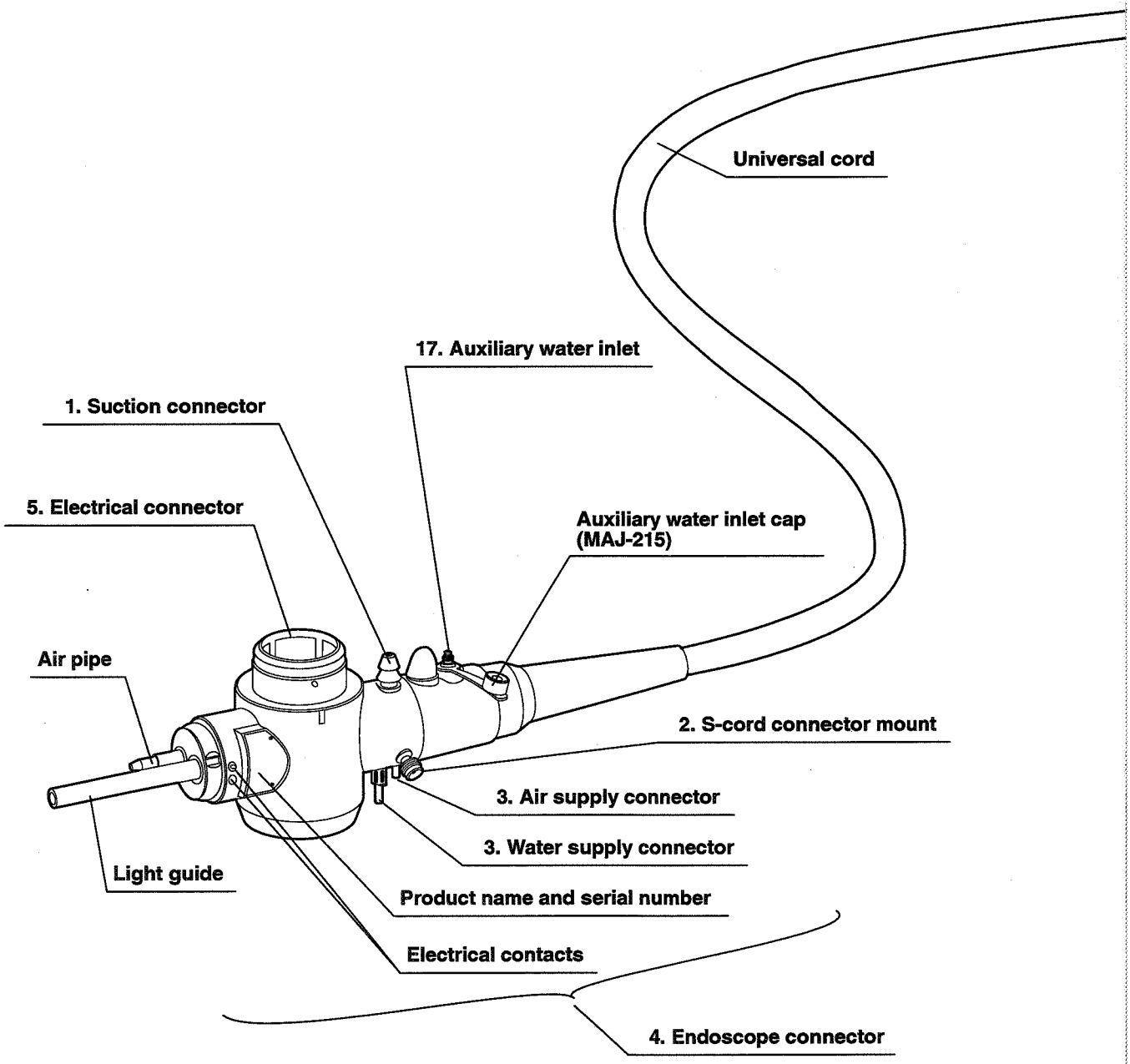
2.1 Nomenclature

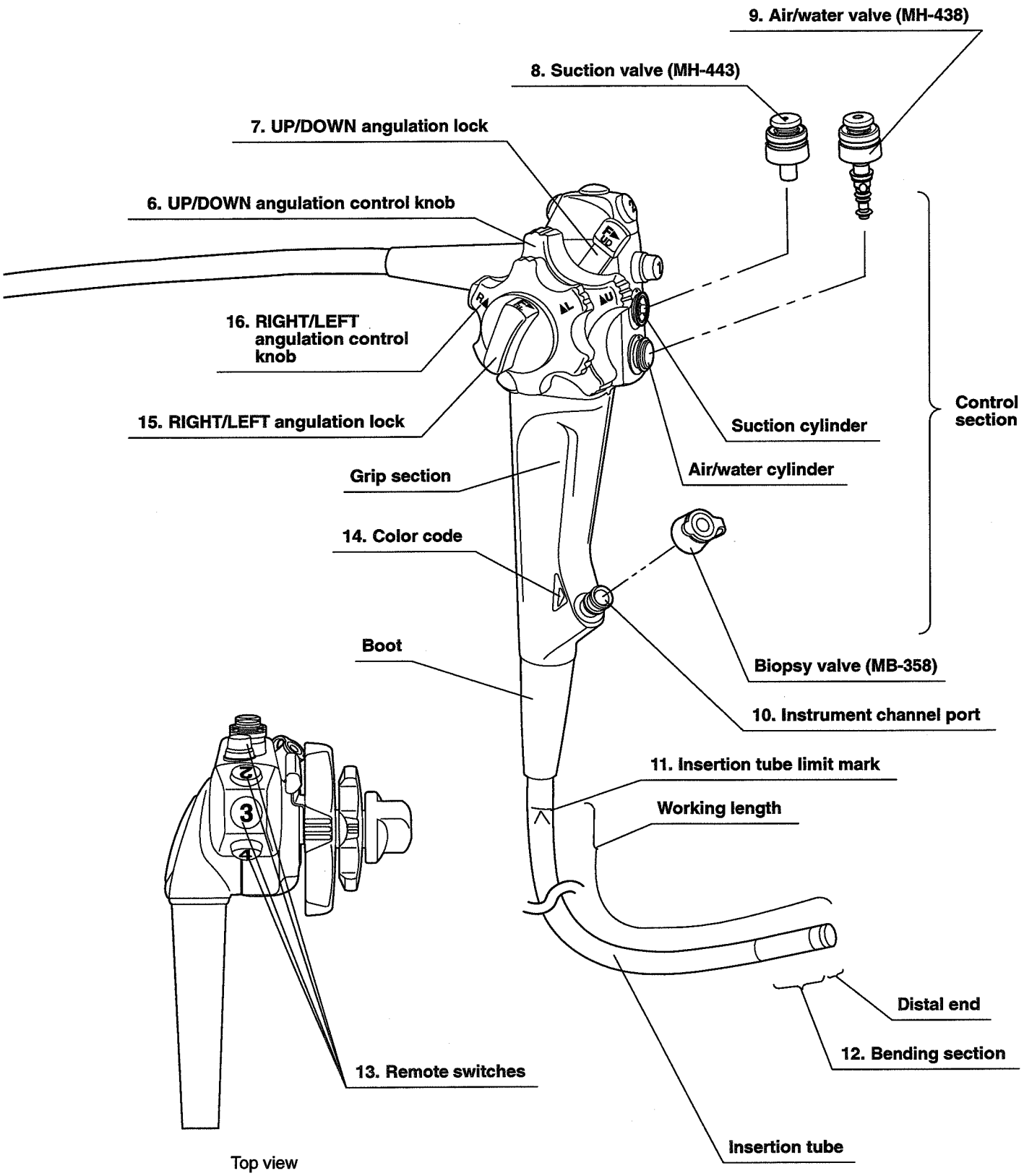
○ **GIF-160, Q160, XP160 only**




9. Air/water valve (MH-438)
8. Suction valve (MH-443)
7. UP/DOWN angulation lock
6. UP/DOWN angulation control knob
16. RIGHT/LEFT angulation control knob
15. RIGHT/LEFT angulation lock
Grip section
14. Color code
Boot
Control section
Suction cylinder
Air/water cylinder
Biopsy valve (MB-358)
10. Instrument channel port
11. Insertion tube limit mark
Working length
Distal end
12. Bending section
Insertion tube
13. Remote switches
Top view

○ For CF-Q160L/I, Q160S only

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7. UP/DOWN angulation lock
6. UP/DOWN angulation control knob
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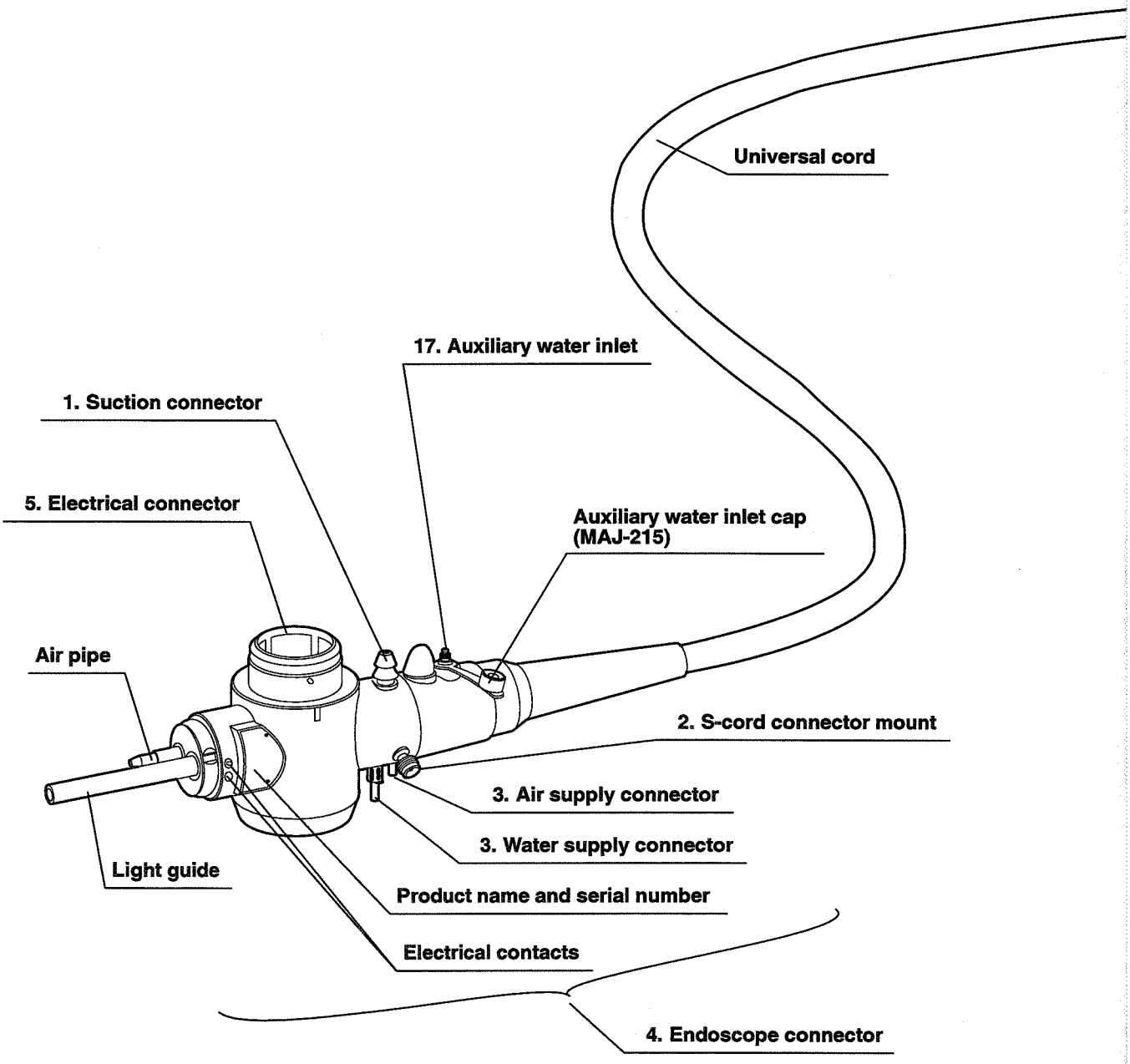
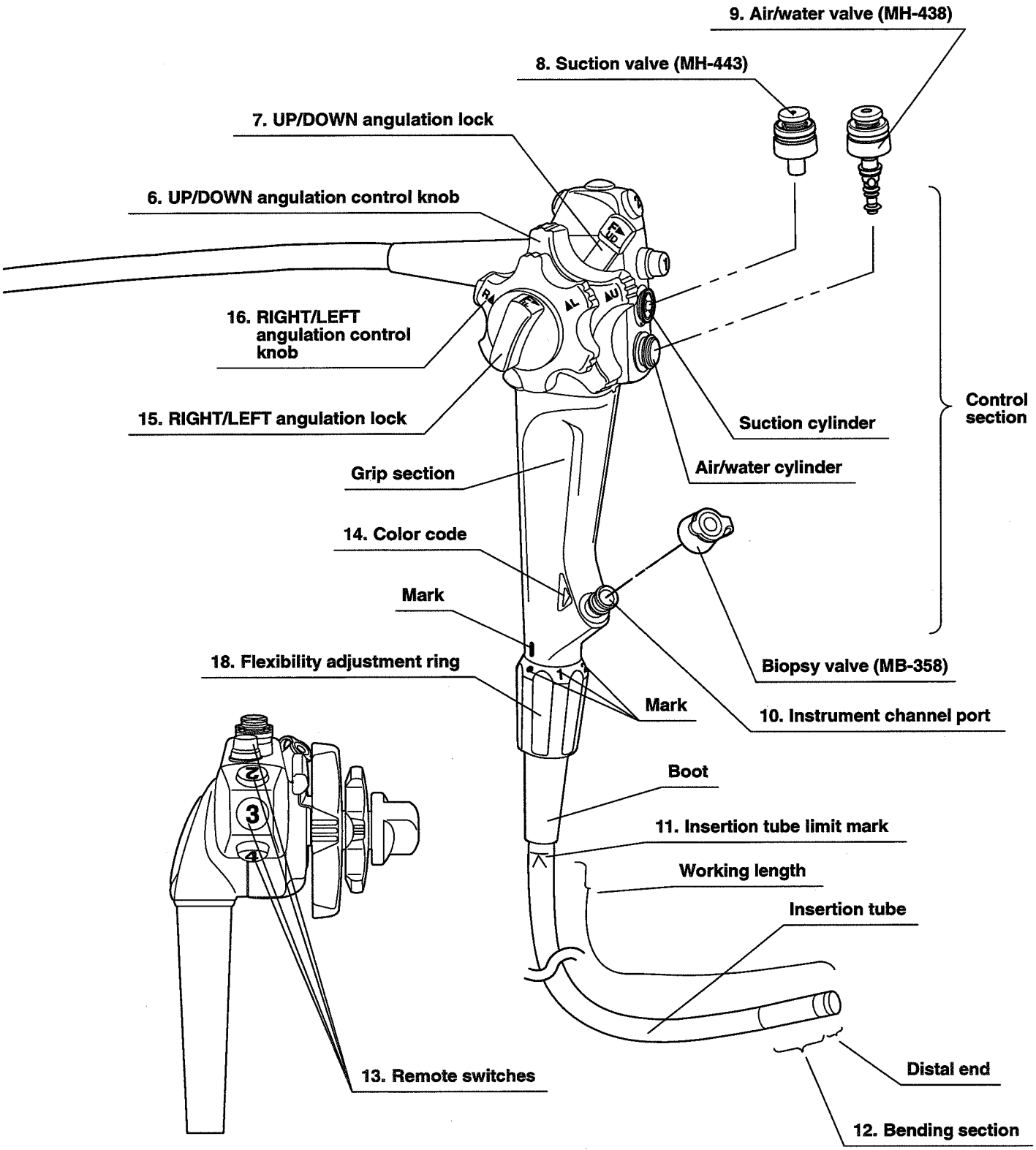
15. RIGHT/LEFT angulation lock
Grip section
14. Color code
Boot
Suction cylinder
Air/water cylinder
Control section
Biopsy valve (MB-358)
10. Instrument channel port
11. Insertion tube limit mark
Working length
Distal end
12. Bending section
13. Remote switches
Insertion tube
Top view

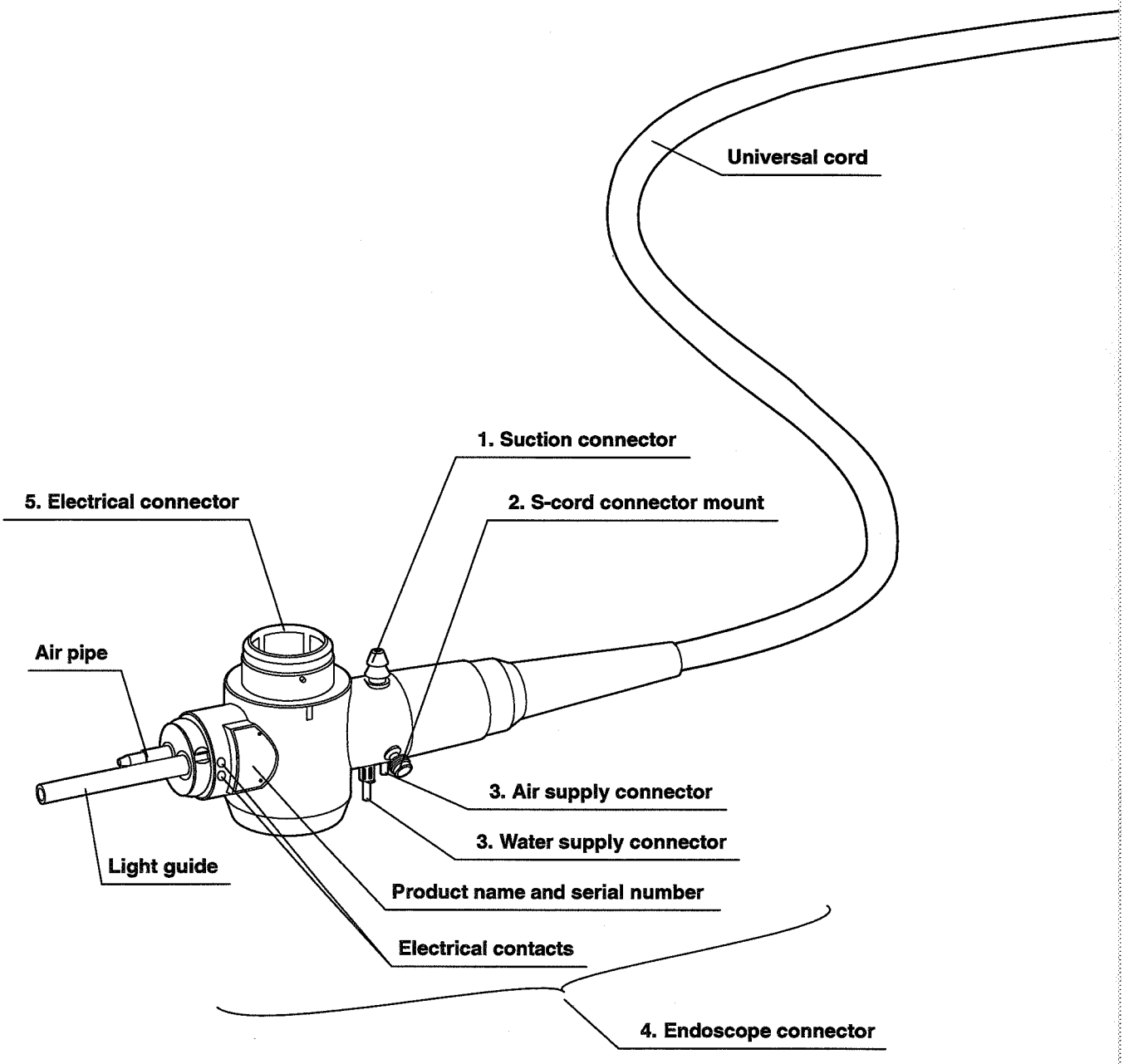
○ For CF-Q160AL/I only

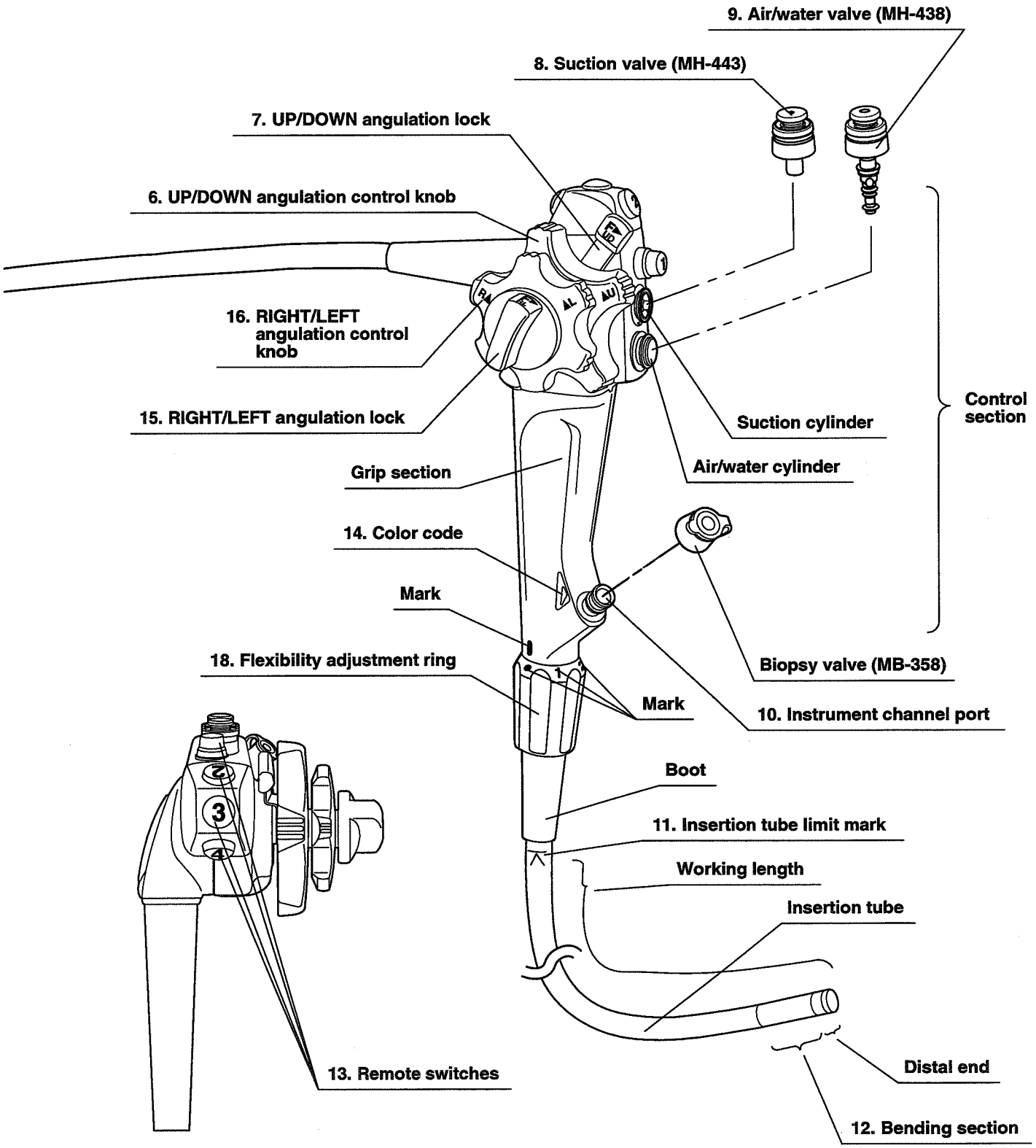



9. Air/water valve (MH-438)
8. Suction valve (MH-443)
7. UP/DOWN angulation lock
6. UP/DOWN angulation control knob
16. RIGHT/LEFT angulation control knob
15. RIGHT/LEFT angulation lock
Suction cylinder
Air/water cylinder
Control section
Grip section
14. Color code
Mark
Biopsy valve (MB-358)
18. Flexibility adjustment ring
Mark
10. Instrument channel port
Boot
11. Insertion tube limit mark
Working length
Insertion tube
13. Remote switches
Distal end
12. Bending section

Top view

❍ For PCF-160AL/I only




9. Air/water valve (MH-438)
8. Suction valve (MH-443)
7. UP/DOWN angulation lock
6. UP/DOWN angulation control knob
16. RIGHT/LEFT angulation control knob
15. RIGHT/LEFT angulation lock
Grip section
14. Color code
Mark
18. Flexibility adjustment ring
Mark
Boot
11. Insertion tube limit mark
Working length
Insertion tube
13. Remote switches
Distal end
12. Bending section
Suction cylinder
Air/water cylinder
Biopsy valve (MB-358)
10. Instrument channel port
Control section
Top view

2.2 Endoscope functions

1. Suction connector

The suction connector connects the endoscope to the suction tube of the suction pump.

2. S-cord connector mount

The S-cord connector mount connects the endoscope with the Olympus electrosurgical unit via the S-cord. The S-cord conducts leakage current from the endoscope to the electrosurgical unit. To connect the S-cord, refer to the instruction manual for the electrosurgical unit.

3. Water supply connector and air supply connector

The water supply connector and the air supply connector connect the endoscope to the water container via the water container tube.

4. Endoscope connector

The endoscope connector connects the endoscope to the output socket of the light source and transmits light from the light source to the endoscope.

5. Electrical connector

The electrical connector connects the endoscope to the EVIS video system center via the videoscope cable. This endoscope contains a memory chip that stores information about the endoscope and communicates this information to the CV-160. For more details, refer to the instruction manual of the CV-160.

6. UP/DOWN angulation control knob

When turned in the "▲U" direction, the bending section moves UP; when turned in the "D▲" direction, the bending section moves DOWN.

7. UP/DOWN angulation lock

Pushing the lever in the "F▶" direction frees angulation. Pushing the lever in the opposite direction locks the bending section at any desired position.

8. Suction valve

The suction valve is depressed to activate suction. The valve is also used to remove any remaining fluid or debris adhering to the objective lens.

9. Air/water valve

The hole in the air/water valve is covered to insufflate air and the valve is depressed to feed water for lens washing. It also can be used to feed air to remove any remaining fluid or debris adhering to the objective lens.

***10.* Instrument channel port**

The instrument channel port functions as:

- channel for the insertion of endo-therapy accessories
- suction channel
- fluid feed channel (from a syringe via the biopsy valve)

***11.* Insertion tube limit mark**

The insertion tube limit mark shows the maximum point to which the endoscope may be inserted into the patient's body.

***12.* Bending section**

The bending section moves the distal end of the endoscope when the UP/DOWN and RIGHT/LEFT angulation control knobs are operated.

***13.* Remote switches 1 to 4**

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

***14.* Color code**

The color 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: GIF-XP160
- Yellow: GIF-160, GIF-Q160, PCF-160AL/I
- Orange: CF-Q160L/I/S, CF-Q160AL/I

***15.* RIGHT/LEFT angulation lock**

Turning the lock in the "F▶" direction frees angulation. Turning the lock in the opposite direction locks the bending section at any desired position.

***16.* RIGHT/LEFT angulation control knob**

When turned in the "R▲" direction, the bending section moves RIGHT; when turned in the "▲L" direction, the bending section moves LEFT.

***17.* Auxiliary water inlet (for CF models only)**

The auxiliary water inlet is used to feed water through the auxiliary water channel. For doing so, open the auxiliary water inlet cap and supply water from a syringe or the water tube of a water pump. Feed water from this inlet when necessary, (e.g. when blood adheres to mucosa in the patient's body cavity). When auxiliary water inlet is not being used, make sure that it is covered by the auxiliary water inlet cap.

18. **Flexibility adjustment ring (For CF-Q160AL/I and PCF-160AL/I only)**
Turn the ring to adjust the flexibility of the insertion tube.
When the "•" mark on the ring is aligned with the "▮" mark at the bottom of the grip section, the insertion tube has maximum flexibility. To decrease the flexibility, turn the ring so that the numbers are aligned with the "▮" mark ("3" corresponds to the minimum flexibility). In the section between "•" and "3", insertion tube flexibility can be changed gradually regardless of the positions of other index markings ("1" and "2").

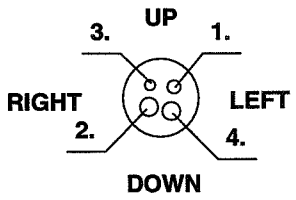
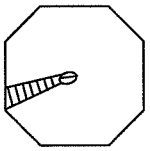
2.3 Specifications

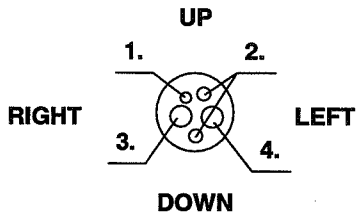
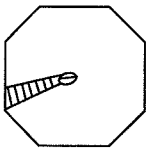
Operating environment

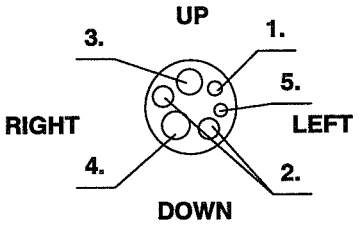
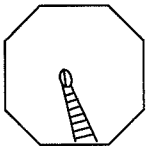
Operating environment	**Ambient temperature**	10 – 40°C (50 – 104°F)
	Relative humidity	30 – 85%
	Air pressure	700 – 1060 hPa (0.7 – 1.1 kgf/cm^2) (10.2 – 15.4 psia)

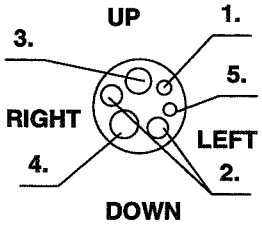
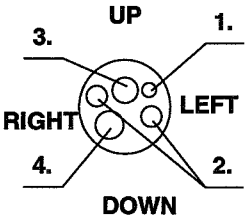
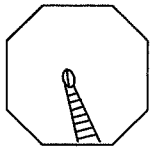
Specifications

Endoscope functions

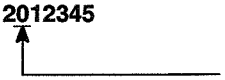
Model		GIF-XP160
Optical system	Field of view	120°
	Direction of view	Forward viewing
	Depth of field	3 – 100 mm
Insertion tube	Distal end outer diameter	ø 5.9 mm
	Distal end enlarged	1. Air/water nozzle 2. Light guide lens 3. Objective lens 4. Instrument channel outlet 
	Insertion tube outer diameter	ø 5.9 mm
	Working length	1030 mm
Instrument channel	Channel inner diameter	ø 2 mm
	Minimum visible distance	3 mm from the distal end
	Direction from which endo-therapy accessories enter and exit the endoscopic image	
Air flow rate		25 cm^3/s Note: Standard when CLV-160 (high air pressure) is used.
Bending section	Angulation range	UP 180°, DOWN 90° RIGHT 100°, LEFT 100°
Total length		1345 mm

Model		GIF-160	GIF-Q160
Optical system	**Field of view**	140°	
	Direction of view	Forward viewing	
	Depth of field	3 – 100 mm	
Insertion tube	**Distal end outer diameter**	ø 8.6 mm	ø 9.8 mm
	Distal end enlarged	1. Air/water nozzle 2. Light guide lens 3. Objective lens 4. Instrument channel outlet 	
	Insertion tube outer diameter	ø 8.6 mm	ø 9.5 mm
	Working length	1030 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		
Air flow rate		25 cm^3/s Note: Standard when CLV-160 (high air pressure) is used.	
Bending section	**Angulation range**	UP 210°, DOWN 90° RIGHT 100°, LEFT 100°	
Total length		1345 mm	

Model		CF-Q160L/I	CF-Q160S
Optical system	**Field of view**	140°	
	Direction of view	Forward viewing	
	Depth of field	3 – 100 mm	
Insertion tube	**Distal end outer diameter**	ø 12.8 mm	
	Distal end enlarged	1. Air/water nozzle 2. Light guide lens 3. Objective lens 4. Instrument channel outlet 5. Auxiliary water channel  	
	Insertion tube outer diameter	ø 12.8 mm	ø 13.2 mm
	Working length	L: 1680 mm I: 1330 mm	S: 730 mm
Instrument channel	**Channel inner diameter**	ø 3.7 mm	
	Minimum visible distance	5 mm from the distal end	
	Direction from which endo-therapy accessories enter and exit the endoscopic image		
Air flow rate		25 cm^3/s Note: Standard when CLV-160 (high air pressure) is used.	30 cm^3/s
Bending section	**Angulation range**	UP 180°, DOWN 180° RIGHT 160°, LEFT 160°	
Total length		L: 2000 mm I: 1650 mm	S: 1040 mm

Model		CF-Q160AL/I	PCF-160AL/I
Optical system	**Field of view**	140°	
	Direction of view	Forward viewing	
	Depth of field	3 – 100 mm	3 – 100 mm
Insertion tube	**Distal end outer diameter**	ø 12.8 mm	ø 11.3 mm
	Distal end enlarged	1. Air/water nozzle 2. Light guide lens 3. Objective lens 4. Instrument channel outlet 5. Auxiliary water channel	1. Air/water nozzle 2. Light guide lens 3. Objective lens 4. Instrument channel outlet
			
	Insertion tube outer diameter	ø 12.8 mm	ø 11.5 mm
	Range of the flexibility adjustment	The rigidity in the stiffest condition is about twice as high as in the softest condition.	
	Working length	L: 1680 mm I: 1330 mm	
Instrument channel	**Channel inner diameter**	ø 3.7 mm	ø 3.2 mm
	Minimum visible distance	5 mm from the distal end	
	Direction from which endo-therapy accessories enter and exit the endoscopic image		
Air flow rate		25 cm^3/s Note: Standard when CLV-160 (high air pressure) is used.	

Bending section	**Angulation range**	UP 180°, DOWN 180° RIGHT 160°, LEFT 160°
Total length		L: 2005 mm I: 1655 mm

Year of manufacture	**2012345** 	The year of manufacture is given in the second digit of the serial number.
Degree of protection against electric shock		TYPE BF applied part

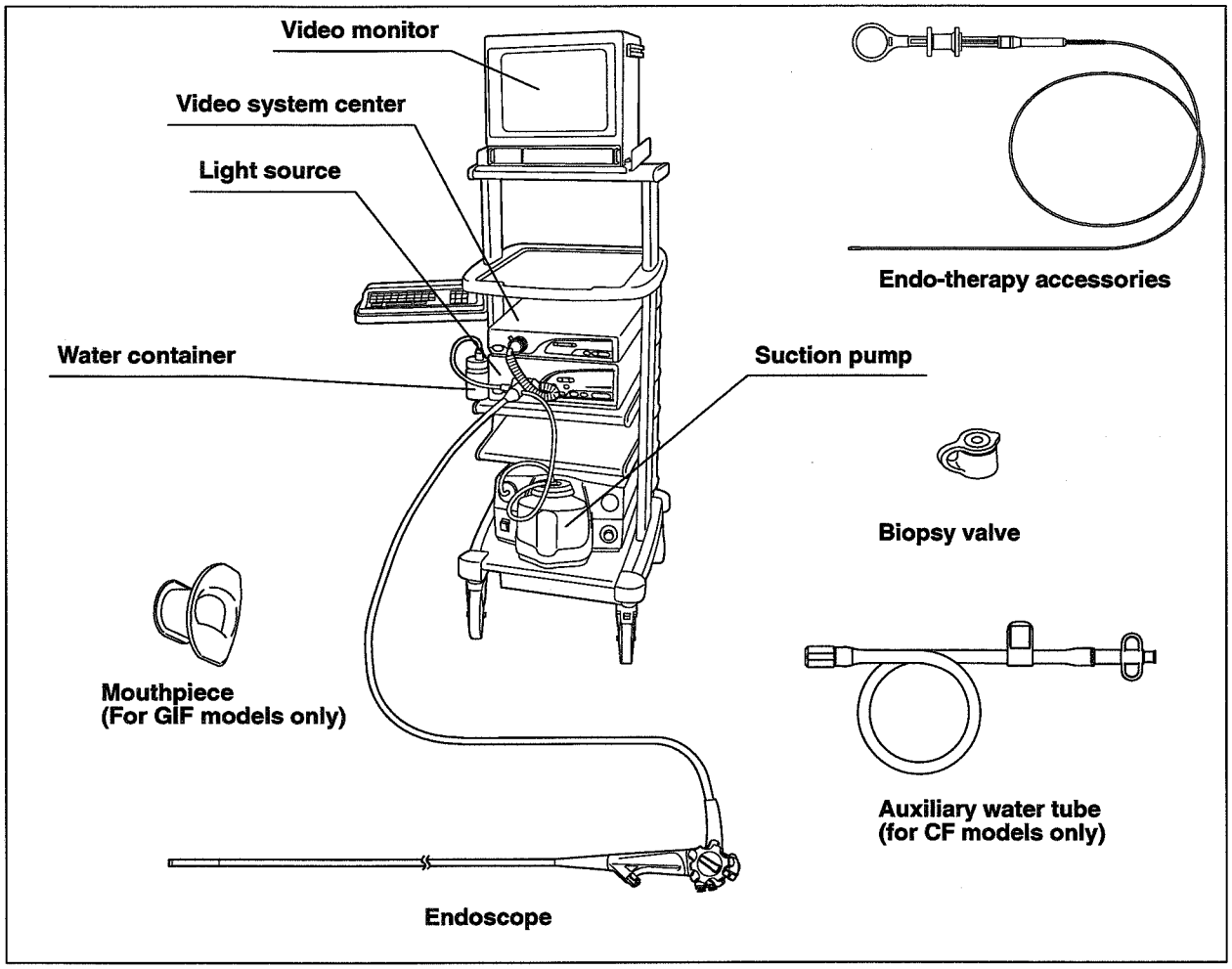
Chapter 3 Preparation and Inspection

WARNING

- Before each case, prepare and inspect this instrument as instructed below. Inspect other equipment used with this instrument as instructed in their respective instruction manuals. Should the slightest irregularity be suspected, do not use this instrument and see Chapter 5, "Troubleshooting". If the irregularity is still suspected after consulting Chapter 5, contact Olympus. Damage or irregularity may compromise patient or user safety and may result in more severe equipment damage.
- 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 "OLYMPUS GIF/CF/PCF TYPE 160 Series ENDOSCOPE REPROCESSING MANUAL".

3.1 Preparation of the equipment

Prepare the equipment shown in Figure 3.1 (for compatibility, see "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 Preparation and inspection of the endoscope

Clean and disinfect or sterilize the endoscope as described in its companion reprocessing manual.

Inspection of the endoscope

1. Inspect the control section and the endoscope connector for excessive scratching.
2. Inspect the boot and the insertion tube near the boot for bends, twists or other irregularities.
3. Inspect the surface of the insertion tube for dents, bulges, swelling or other irregularities.
4. Carefully run your fingertips over the entire length of the insertion tube. Inspect for any protruding objects or other irregularities (see Figure 3.2).

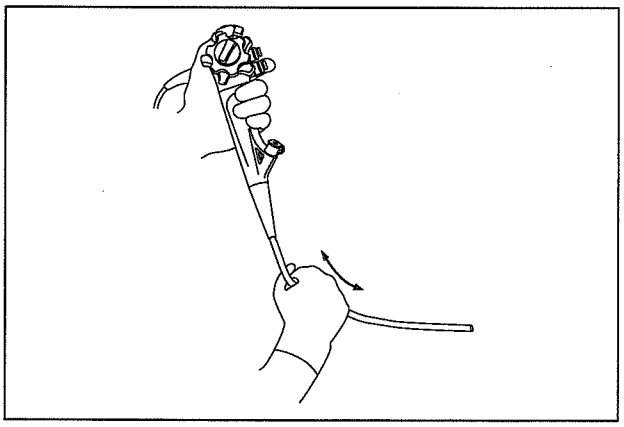


Figure 3.2

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 there is no play.
7. Inspect the objective lens and the air/water nozzle at the distal end of the endoscope's insertion tube for dents, bulges, swelling or other irregularities.
8. Inspect the auxiliary water inlet cap at the endoscope connector (for CF models only).

Inspection of the flexibility adjustment mechanism (for CF-Q160AL/I and PCF-160AL/I only)

1. Confirm that the index markings on the flexibility adjustment ring and the "▮" mark at the bottom of the grip section are clearly visible.

WARNING

Do not use the endoscope if the markings are not clearly visible. If the operator is uncertain of the flexibility of the endoscope, insertion and manipulation of the endoscope may cause patient pain and/or injury.

2. Confirm that the flexibility adjustment ring can be turned smoothly when the insertion tube is straight.

NOTE

If the insertion tube is coiled with a small diameter, the flexibility adjustment ring may not operate smoothly. This does not indicate a malfunction.

3. Set the insertion tube to the most flexible and most rigid conditions, respectively. In each case, hold the insertion tube with two hands between 30 and 50 cm from the distal end, and bend it gently as shown in Figure 3.3. Confirm that the actual flexibility varies according to the flexibility adjustment settings.

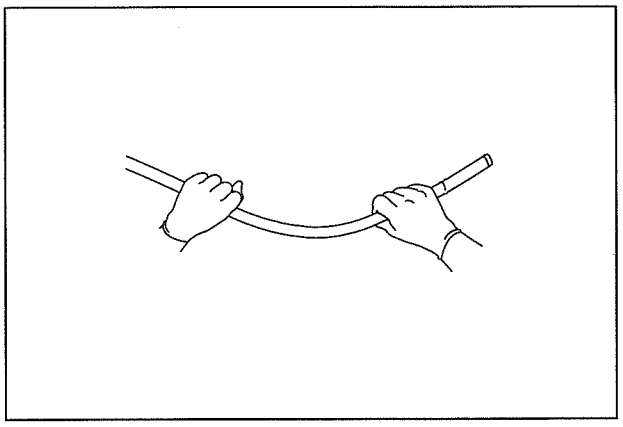


Figure 3.3

Inspection of the bending mechanisms

Perform the following inspections while the bending section is straight.

❍ Inspection for smooth operation

1. Confirm that both the UP/DOWN and RIGHT/LEFT angulation locks are placed in the "F▶" direction.
2. Turn the UP/DOWN and RIGHT/LEFT angulation control knobs slowly in each direction until they stop. Confirm that the bending section angulates smoothly and correctly and that maximum angulation can be achieved.
3. Turn the UP/DOWN and RIGHT/LEFT angulation control knobs slowly to their respective neutral positions. Confirm that the bending section returns smoothly to an approximately straight condition.

❍ Inspection of the UP/DOWN angulation mechanism

1. Turn the UP/DOWN angulation lock in the opposite direction of the "F▶" mark. Then turn the UP/DOWN angulation control knob in the "▲U" or the "D▲" direction until it stops.
2. Confirm that the angle of the bending section is roughly stabilized when the UP/DOWN angulation control knob is released.
3. Confirm that the bending section straightens out when the UP/DOWN angulation lock is turned in the "F▶" direction and the UP/DOWN angulation control knob is released.

❍ Inspection of the RIGHT/LEFT angulation mechanism

1. Turn the RIGHT/LEFT angulation lock in the opposite direction of the "F▶" mark. Then turn the RIGHT/LEFT angulation control knob in the "R▲" or the "▲L" direction until it stops.
2. Confirm that the angle of the bending section is roughly stabilized when the RIGHT/LEFT angulation control knob is released.
3. Confirm that the bending section straightens out when the RIGHT/LEFT angulation lock is turned in the "F▶" direction and the RIGHT/LEFT angulation control knob is released.

3.3 Preparation and inspection of accessories

Clean and disinfect or sterilize the air/water valve, suction valve and biopsy valve as described in the endoscope's companion reprocessing manual.

Inspection of the air/water and suction valves

Inspect the air/water and suction valves (see Figures 3.4 and 3.5).

1. Confirm that the holes are not blocked.
2. Confirm that the valves are not deformed or cracked.
3. Check for excessive scratching or tears in the air/water valve's seals.

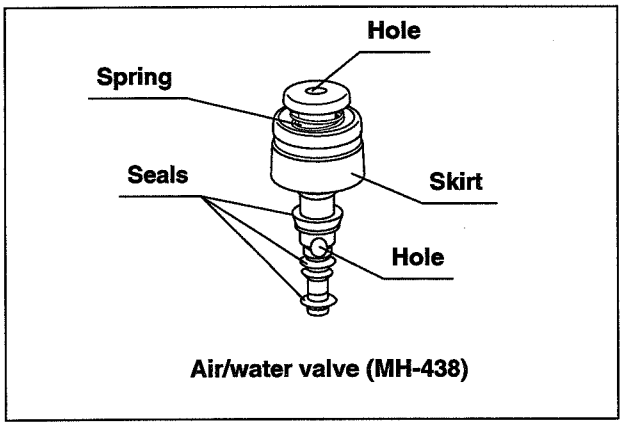


Figure 3.4

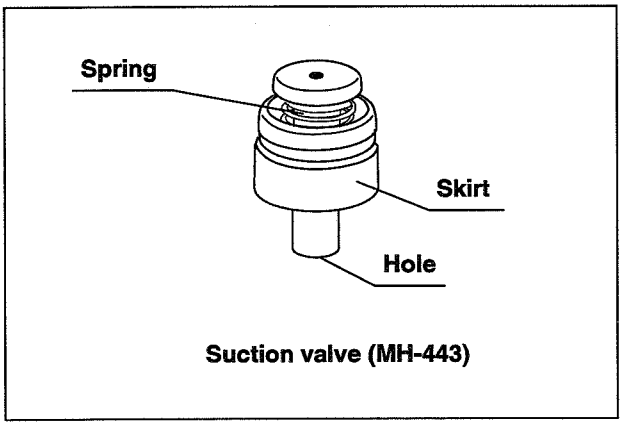


Figure 3.5

CAUTION

- The air/water and suction valves are consumables. If the inspection of the air/water or suction valve reveals any irregularities, use new valves.
- Only air/water valve (MH-438) and suction valve (MH-443) should be used with this endoscope. These valves are not designed for use with models other than 160/40 series endoscopes.
- Fading or discoloration of the air/water valve or suction valve is not a functional problem.

Inspection of the biopsy valve

WARNING

A damaged or deformed biopsy valve can reduce the efficacy of the endoscope's suction system and may cause patient debris to leak or spray from the endoscope.

1. Confirm that the biopsy valve is free from cracks, tears or deformation.
2. Attach the cap to the main body (see Figure 3.6).

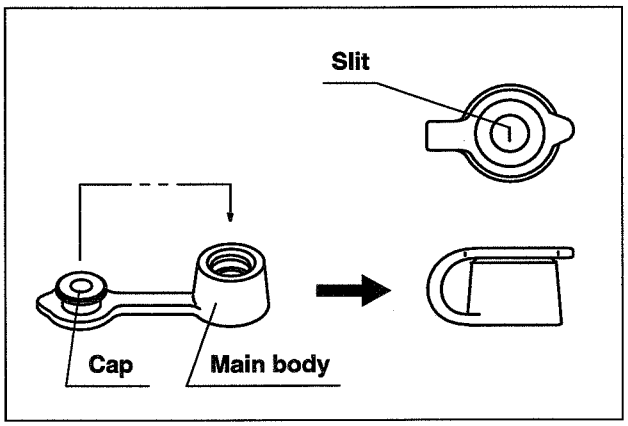


Figure 3.6

CAUTION

The biopsy valve is an item that is subject to wear, and it should be inspected before each use. Replace the biopsy valve with a new one if irregularities and/or excessive wear are detected.

3.4 Attaching accessories to the endoscope

CAUTION

The air/water valve and the suction valve do not require lubrication. Lubricants can cause swelling of the valves' seals, which will negatively affect the valve function.

Attaching the suction valve

1. Align the two metal ridges on the underside of the suction valve with the two holes in the suction cylinder.
2. Attach the suction valve to the suction cylinder of the endoscope (see Figures 3.7 and 3.8). Confirm that the valve fits properly without any bulging of the skirt.

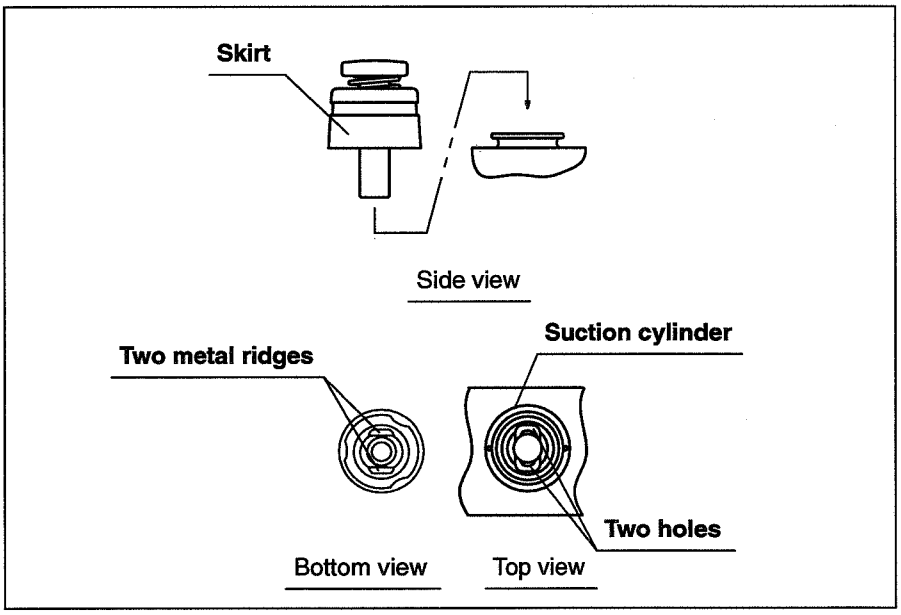


Figure 3.7

NOTE

The suction valve will make a whistling noise when it is dry; this does not indicate a malfunction.

Attaching the air/water valve

Attach the air/water valve to the air/water cylinder of the endoscope (see Figure 3.8). Confirm that the valve fits properly without any bulging of the skirt.

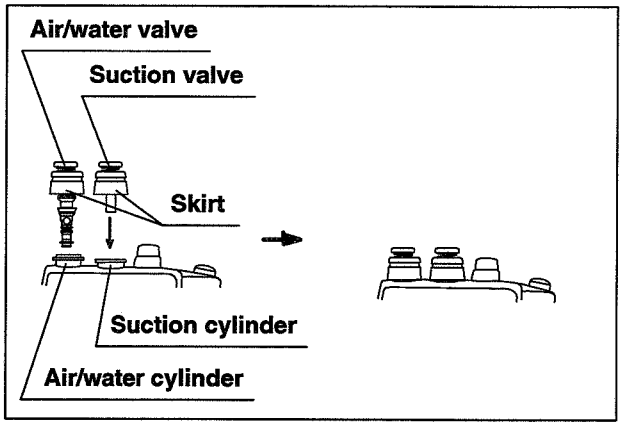


Figure 3.8

NOTE

The air/water valve may 'stick' at first, but it should operate smoothly after it is depressed a few times.

Attaching the biopsy valve

Attach the biopsy valve to the instrument channel port of the endoscope (see Figure 3.9). Confirm that the cap fits properly.

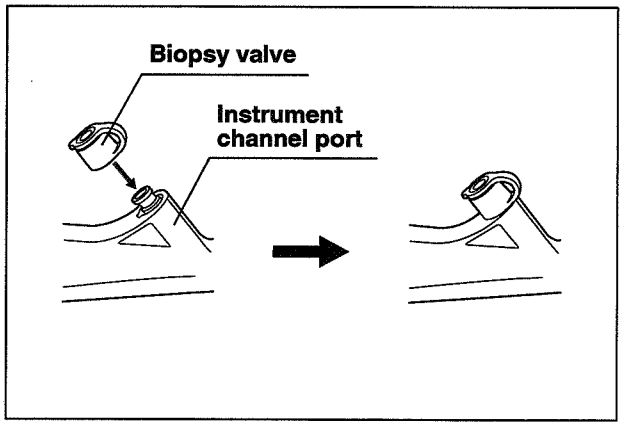


Figure 3.9

3.5 Preparation, inspection and connection of ancillary equipment

Preparation and inspection of ancillary equipment

CAUTION

Attach the water container to the specified receptacle on the trolley or the light source. If the water container is attached anywhere else, water may drip from the water container's water supply tube, and can impair the performance of the equipment.

NOTE

- To confirm the compatibility of the endoscope and EVIS video system center, please refer to the "System chart" in the Appendix.
- The water container (MH-884/MAJ-901) should be used with this endoscope. This water container is not designed for use with models other than 160/40 series endoscopes.

1. Prepare and inspect the light source, video system center, video monitor, water container, suction pump and endo-therapy accessories according to their respective instruction manuals.
2. Confirm that the auxiliary water tube is free from cracks, scratches, flaws and other damages (for CF models only).

Connection of the endoscope and ancillary equipment

CAUTION

- Firmly connect the suction tube to the suction connector. If the suction tube is not attached properly, fluid may drip from the tube and impair the performance of the equipment.
- When using the GIF-XP160, use the videoscope cable EXERA (MAJ-843). This endoscope is not compatible with the videoscope cable 100 (MH-976).

1. Insert the endoscope connector completely into the output socket of the light source.
2. Connect the water container's connection adapter to the air supply connector and water supply connector as shown in Figure 3.10.

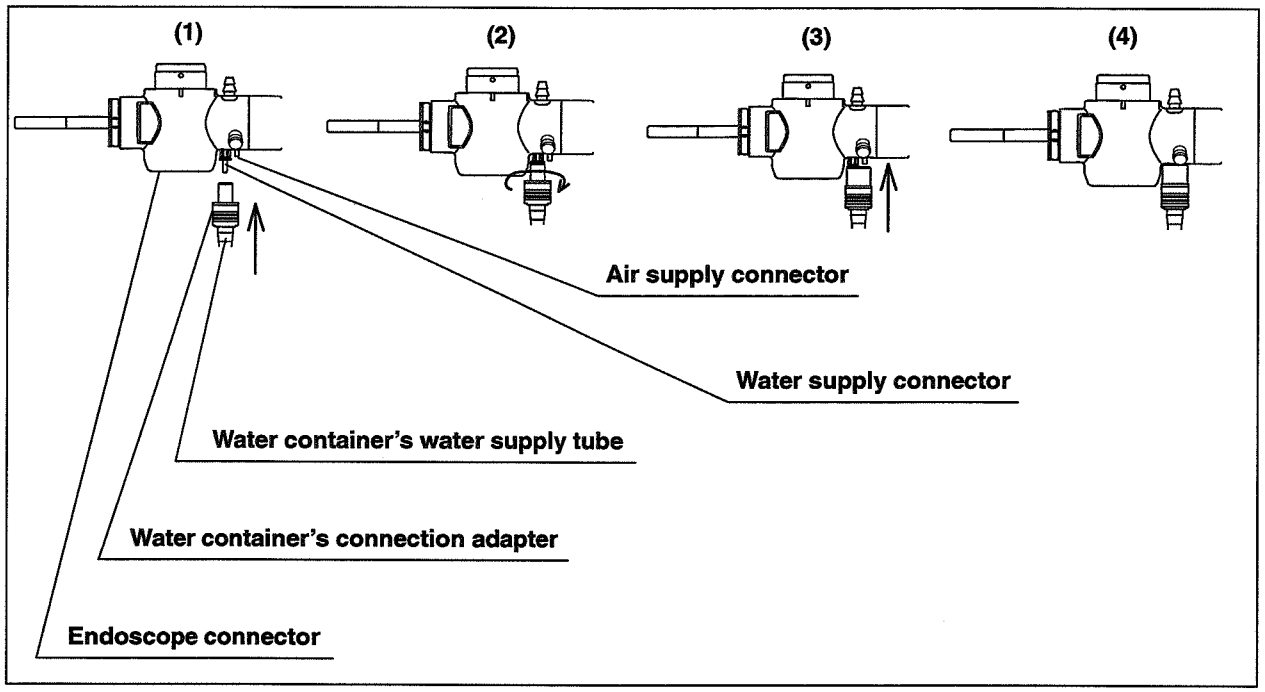


Figure 3.10

3. Turn the video system center OFF.

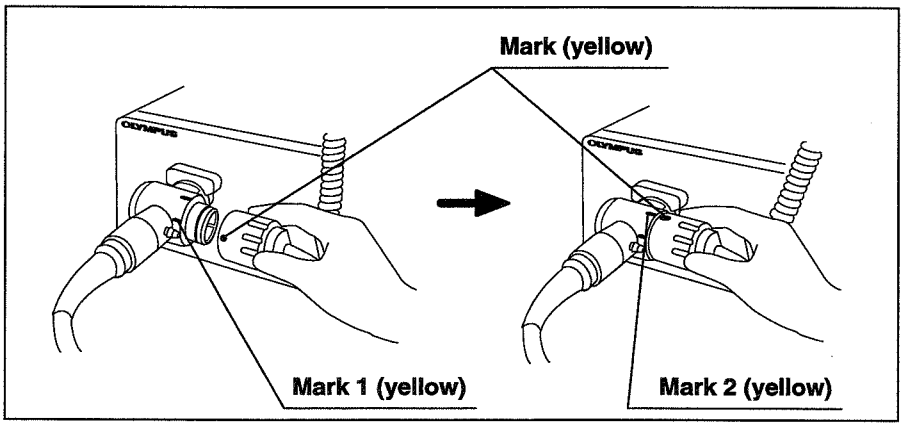


Figure 3.11

4. Align the mark on the videoscope cable EXERA/100 with the mark 1 on the electrical connector and push it in until it stops.

5. Turn the videoscope cable EXERA/100 clockwise until it stops.

6. Confirm that the mark on the videoscope cable EXERA/100 is aligned with the mark 2 on the endoscope connector.

7. Connect the suction tube from the suction pump to the suction connector on the endoscope connector (see Figure 3.12).

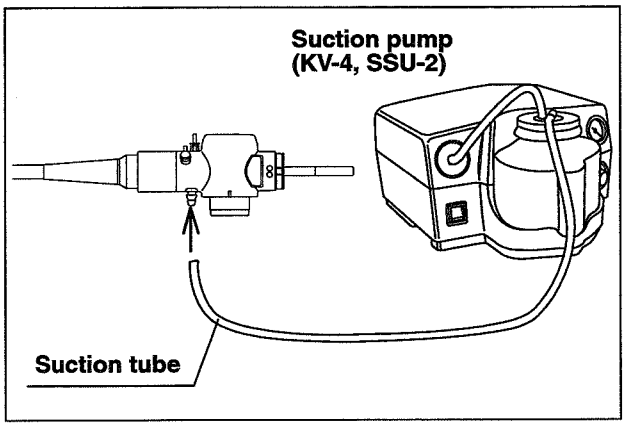


Figure 3.12

8. When the auxiliary water inlet cap put a sealing on auxiliary water inlet, uncap it from auxiliary water inlet.

9. Connect the auxiliary water tube to auxiliary water inlet on the endoscope connector.

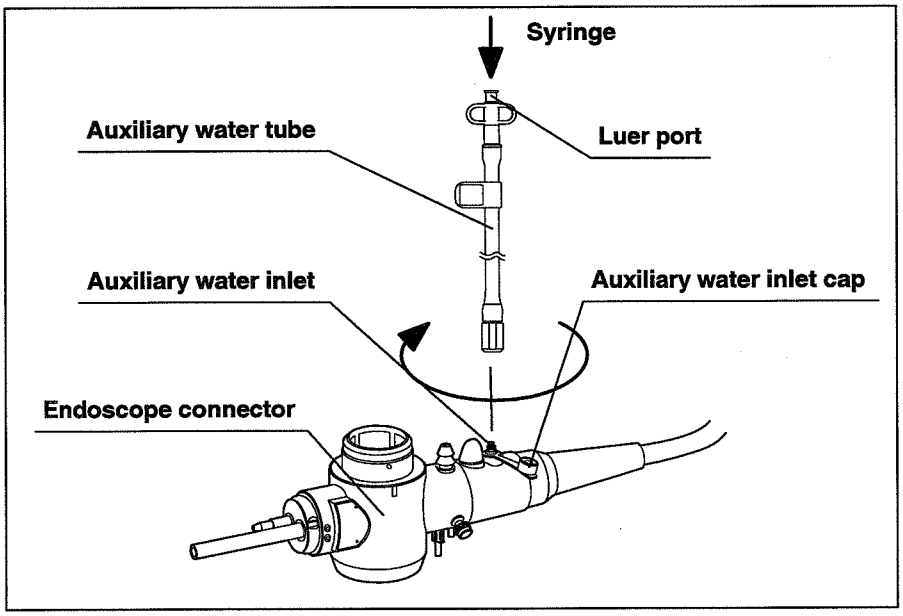


Figure 3.13

3.6 Inspection of the endoscopic system

Inspection of the endoscopic image

Turn ON the EVIS video system center, light source and video monitor and inspect the endoscopic image as described in their respective instruction manuals.

NOTE

If the object cannot be seen clearly, wipe the objective lens using a clean, lint-free cloth moistened with 70% ethyl or isopropyl alcohol.

Inspection of the air feeding function

1. Switch the airflow regulator of the light source to "High", as described in the light source's instruction manual.
2. Immerse the distal end of the insertion tube in sterile water to a depth of 10 cm. Confirm that no air bubbles are emitted when the air/water valve is not operated.
3. With the distal end immersed to a depth of 10 cm, cover the hole in the air/water valve with your finger and confirm that air bubbles are continuously emitted from the air/water nozzle.
4. Uncover the hole in the air/water valve and confirm that no air bubbles are emitted from the air/water nozzle.

WARNING

If a stream of air bubbles is emitted from the air/water nozzle even though the air/water valve is not being operated and the distal end of the insertion tube is 10 cm or more below the surface of the water, the air feeding function is still operating. If the endoscope is used while air is continuously being fed, over-insufflation and patient injury may result.
If air bubbles are emitted, remove and reattach the air/water valve correctly, or replace it with another one. If this fails to stop air bubbles from being emitted, do not use the endoscope, as there may be a malfunction. Contact Olympus.

NOTE

When the distal end of the insertion tube is immersed less than 10 cm below the surface of the sterile water, a small amount of air bubbles may be emitted from the air/water nozzle even when the air/water valve is not operated. This does not indicate a malfunction.

Inspection of the objective lens cleaning function

1. Keep the air/water valve's hole covered with your finger and depress the valve. Observe the endoscopic image and confirm that water is emitted from the air/water nozzle.
2. Release the valve. Observe the endoscopic image and confirm that the emission of water stops and that the valve returns smoothly to its original position.
3. While observing the endoscopic image, feed air after feeding water by covering the hole in the air/water valve with your finger. Confirm that the emitted air dries the objective lens and clears the endoscopic image.

NOTE

- When the air/water valve is depressed for the first time, it may take a few seconds before water is emitted.
- If the air/water valve returns to its original position slowly after water feeding, remove the air/water valve and moisten the seals with sterile water.
- During the inspection, place the distal end of the endoscope in a beaker or other container so that the floor does not get wet.

Inspection of the suction function

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 valve. Confirm that suction stops and the suction 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

WARNING

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.

Insert the endo-therapy accessory through the biopsy valve. Confirm that the endo-therapy accessory extends smoothly from the distal end.

Inspection of the auxiliary water feeding function (for CF models only)

1. Attach a syringe containing sterile water or water tube of water pump to the luer port of the auxiliary water tube. Feed water and confirm that water is emitted from the auxiliary water channel at the distal end of the insertion tube.
2. Make sure that no water leaks at the connection from the auxiliary water tube to the auxiliary water inlet.
3. Make sure that no water leaks at the connection from the auxiliary water tube to the syringe or water tube of water pump.
4. Disconnect the syringe or water tube of water pump from luer port of the auxiliary water tube. Make sure that no water leaks at the luer port of the auxiliary water tube and the distal end of the insertion tube.

CAUTION

If the auxiliary water channel is used for feeding water, don't detach the auxiliary water tube from the auxiliary water inlet until the endoscope is precleaned refer to the "OLYMPUS GIF/CF/PCF TYPE 160 Series ENDOSCOPE REPROCESSING MANUAL". If the auxiliary water tube is detached before precleaning, water remaining in the auxiliary water channel may be spilled on the surrounding equipment. This could cause damage and/or malfunction of the equipment.

NOTE

To prevent channel clogging, use sterile water only.

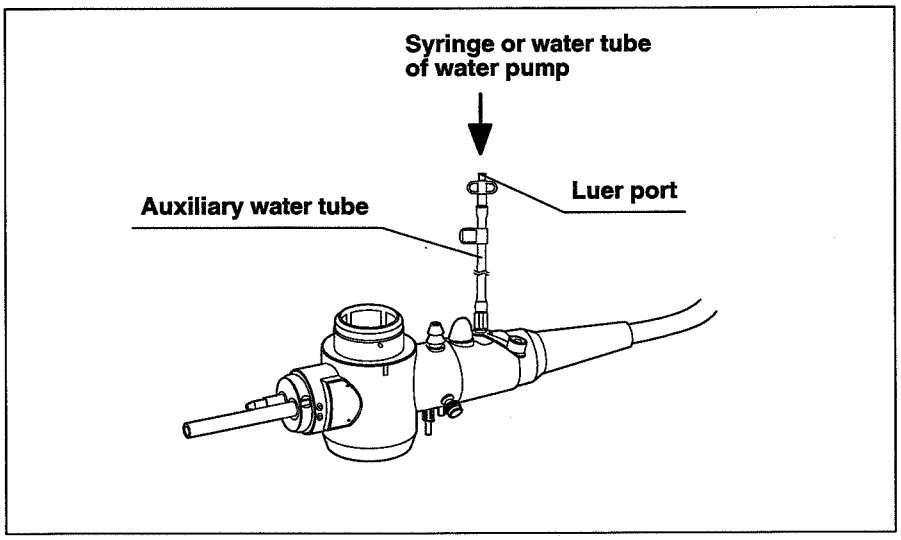


Figure 3.14

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

- Anytime you suspect an abnormality in an endoscope function, stop the examination immediately and slowly remove it while viewing the endoscopic image. Using an endoscope that is not functioning properly may cause patient injury.
- If the endoscopic image on the video monitor should unexpectedly disappear or freeze during an examination, and cannot be restored, turn the video system center power switch OFF and then ON again. If the image still does not appear, stop the examination immediately, turn the video system center OFF, turn the UP/DOWN and RIGHT/LEFT angulation locks in the "F▶" direction. Then, turn the UP/DOWN angulation control knob slowly to align the letter "U" with the suction valve. Release the angulation control knob, and carefully withdraw the endoscope from the patient. If an endo-therapy accessory is being used, withdraw it in the safest possible manner before withdrawing the endoscope.
- If the angulation control mechanism or any other part of the system is not functioning properly, stop the procedure immediately; set the flexibility adjustment ring to maximum flexibility, free the angulation locks and do not operate the angulation control knobs unless absolutely necessary. Then carefully withdraw the endoscope while observing the endoscopic image. 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.

- Never insert or withdraw the endoscope's insertion tube and perform flexibility adjustment while the endo-therapy accessory extends from the distal end of the endoscope. Patient injury can result.
- Wear personal protective equipment to guard against dangerous chemicals and potentially infectious material. 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.
- If the flexibility adjustment ring becomes jammed during an examination, immediately stop the procedure. Then, turn the UP/DOWN and RIGHT/LEFT angulation locks in the "F▶" direction and, without touching any of the angulation control knobs or angulation locks, slowly withdraw the endoscope from the patient while observing the endoscopic image. Performing an examination while the insertion tube is set to an inappropriate degree of flexibility may cause patient pain and/or injury.
- Any endoscope has the potential to cause patient injury if the insertion tube is forcibly inserted, withdrawn and/or twisted with excessive force. It is generally believed that an endoscope with a more rigid insertion tube can control the intestines more easily provided that it is used properly. However it should be noted that such an endoscope, if used improperly, is more likely to cause patient pain and/or injury than an endoscope with a more flexible insertion tube.
- Flexible part of the insertion tube of this endoscope can be adjusted in equal, softer and harder than that of CF-Q140L/I (CF-Q160AL/I only). Flexible part of the insertion tube of this endoscope can be adjusted in equal and harder than that of PCF-140L/I (PCF-160L/I only). The insertion tube of the endoscope should be adjusted to the appropriate flexibility for each case. Always confirm the flexibility of the insertion tube before inserting it into the patient, and adjust the flexibility as necessary according to the case, region and patient situation during an examination. If you are unsure of the appropriate flexibility of the insertion tube, set it to the maximum flexibility. Continuing the examination while the insertion tube is set to an inappropriate degree of flexibility may cause patient pain and/or injury.

4.1 Insertion

Holding and manipulating the endoscope

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

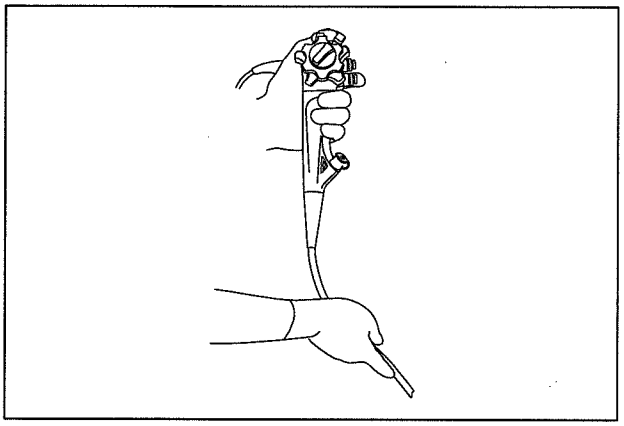


Figure 4.1

Insertion of the endoscope

CAUTION

- Do not apply olive oil or products containing petroleum-based lubricants (e.g. vaseline). These products may cause stretching and deterioration of the bending section's covering.
- To prevent the patient from accidentally biting the insertion tube during an examination with the GIF models, it is strongly recommended that a mouthpiece be placed in the patient's mouth before inserting the endoscope.

1. If necessary, apply a medical-grade, water-soluble lubricant to the insertion tube and the splinting tube.
2. Place the mouthpiece in the patient's mouth (for GIF models only).
3. Push the sprinting tube over the insertion tube if required, and lubricate it (for CF/PCF models only).

4. Always view the endoscopic image when passing the distal end of the endoscope from the mouth to the pharynx (for GIF models only) or from the anus to the rectum (for CF/PCF models only).

CAUTION

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).

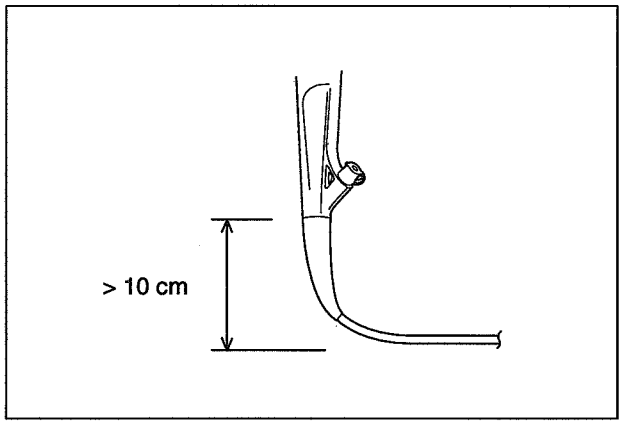


Figure 4.2

Angulation of the distal end

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

NOTE

- The endoscope's angulation locks are used to hold the angulated distal end in position. When passing an endo-therapy accessory through the channel while the angulation is locked, the angulation control knobs should be held in place to help maintain the angle of the distal end.
- When operating the UP/DOWN or RIGHT/LEFT angulation lock, hold the angulation control knob stationary with your finger. If this is not done, the angulation will change.

Flexibility adjustment

WARNING

- When changing the insertion tube's flexibility during a procedure, turn the flexibility adjustment ring slowly, and closely monitor, the position of flexibility index marking, the endoscopic image and the patient's condition. If the endoscopic image moves suddenly or is lost, or if the patient complains of pain while you are changing the insertion tube's flexibility, stop decreasing the flexibility. Otherwise, further patient pain and/or injury may occur.
- In case more rigidity will be given to the insertion tube during an examination, always release any loop of the insertion tube before changing rigidity. Confirm that the scope is inserted without making loop under fluoroscopy, if necessary. If the force required to turn the flexibility adjustment ring is greater during the procedure than it was when inspecting the endoscope, it may mean that the insertion tube is excessively bent inside the patient. In this case, straighten the insertion tube as much as possible before attempting to increase the rigidity. Failure to do so may cause patient pain and/or injury.
- If the flexibility adjustment ring becomes jammed during an examination, immediately stop the procedure. Then, turn the UP/DOWN and RIGHT/LEFT angulation locks in the "F▶" direction and, without touching any of the angulation control knobs or angulation locks, slowly withdraw the endoscope from the patient while observing the endoscopic image. Performing an examination while the insertion tube is set to an inappropriate degree of flexibility may cause patient pain and/or injury.

Before inserting or withdrawing the endoscope, set the insertion tube to an appropriate level of flexibility by turning the flexibility adjustment ring as required (see Figure 4.3).

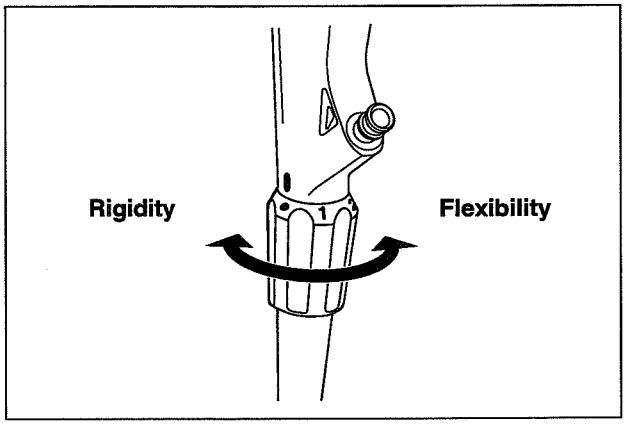


Figure 4.3

Air and water feeding and suction

Air and water feeding

WARNING

- Confirm that the hole in the air/water valve is not occluded. This could make it impossible to stop air feeding.
- If the water flow does not appear in the endoscopic image while you are depressing the air/water valve, release the valve and inspect the water level in the water container.
- If the sterile water level in the water container is too low, then air, not water, will be supplied. In this case, turn the airflow regulator switch on the light source to OFF and add more sterile water to the water container.
- If sterile water cannot be fed even though there is enough sterile water in the water container, the endoscope or other equipment may not be working properly. Stop the procedure immediately and contact Olympus.

Clean the objective lens by covering the air/water valve's hole to feed air from the air/water nozzle at the distal end, or depress the air/water valve to feed water onto the objective lens (see Figure 4.4).

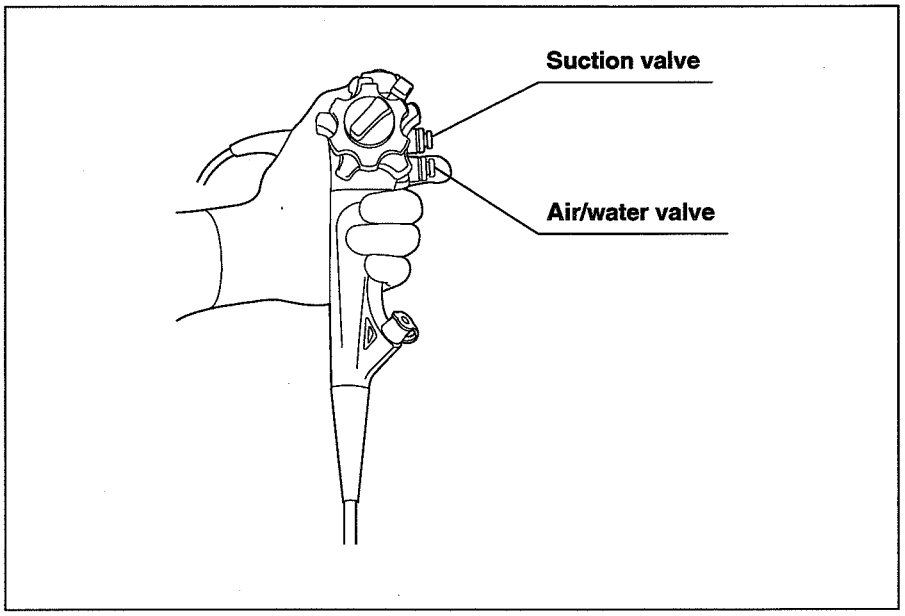


Figure 4.4

Suction

WARNING

Avoid aspirating solid matter or thick fluids; channel or valve clogging can occur. If the suction valve clogs and suction cannot be turned OFF, disconnect the suction tube from the suction connector on the endoscope connector. Stop the procedure and withdraw the endoscope from the patient while viewing the endoscopic image.

CAUTION

During the procedure, make sure that the suction bottle does not fill completely or overflow. Aspirating fluids into a full bottle can damage the suction pump.

Depress the suction valve to aspirate excess fluid or other debris obscuring the endoscopic image (see Figure 4.4).

NOTE

Performing both air feeding and suction at the same time sometimes makes it easier to remove water droplets from the objective lens surface.

❍ Auxiliary water feeding (for CF models only)

WARNING

Use sterile water only. Using non-sterile water can result in growth of bacteria or channels clogging, and this could pose an infection control risk and tissue irritation.

CAUTION

- Always use a cleaned and disinfected or sterile auxiliary water tube (MAJ-855).
- Don't detach the auxiliary water tube from the auxiliary water inlet until the endoscope is precleaned refer to the "OLYMPUS GIF/CF/PCF TYPE 160 Series ENDOSCOPE REPROCESSING MANUAL". If the auxiliary water tube is detached before precleaning, water remaining in the auxiliary water channel may be spilled on the surrounding equipment. This could cause damage and/or malfunction of the equipment.

1. Attach a syringe containing sterile water or water tube of the water pump to the luer port of the auxiliary water tube. Feed water.
2. In case disconnecting the syringe or water tube of the water pump from the auxiliary water tube during examinating, remove it from the luer port.

Observation of the endoscopic image

WARNING

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.

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

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.

WARNING

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.

Insertion of endo-therapy accessories into the endoscope

CAUTION

Work carefully when using an open biopsy valve; the biopsy valve may leak when uncapped.

1. Refer to the "System chart" in the Appendix to determine instrument compatibility.
2. While holding the UP/DOWN and RIGHT/LEFT angulation knobs stationary, slowly insert the endo-therapy accessory through the slit of the biopsy valve.

CAUTION

- If significant resistance is encountered and insertion is difficult, straighten the bending section as much as possible without losing the endoscopic image. Inserting endo-therapy accessories with excessive force may damage the endoscope and/or cause patient injury.
- Confirm that the tip of the endo-therapy accessory is closed or retracted into its sheath and slowly insert the endo-therapy accessory into the biopsy valve. Do not open the tip of the endo-therapy accessory or extend the tip of the endo-therapy accessory from its sheath while inserting the endo-therapy accessory into 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.

3. Hold the endo-therapy accessory approximately 4 cm from the biopsy valve and slowly advance it into the biopsy valve using slow, short strokes.

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

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

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.

Use of non-flammable gases (for CF/PCF models only)

WARNING

Performing treatment while the intestines are filled with a flammable gas could result in an explosion and serious patient injury. If the intestines contain a flammable gas, replace it with air or a non-flammable gas such as CO_2 before performing high-frequency or laser cauterization.

NOTE

Using CO_2 gas during endoscopic examinations of the colon and rectum, etc. may reduce post-examination pain.

When non-flammable gas is applicated use the water container (MH-970/MAJ-902) only and carefully follow its instruction manual.

High frequency cauterization

WARNING

- If the intestines contain a flammable gas, replace it with air or a non-flammable gas such as CO_2 before performing high frequency cauterization.
- Not all parts of the endoscope are electrically insulated. When applying high frequency current, there is a danger of unintentional diathermy burns. Always wear electrically insulating chemical-resistant gloves.
- To avoid patient injury and/or damage to the endoscope, never emit high frequency current before confirming that the electrode section of the high frequency endo-therapy accessory is in the correct position in the endoscopic image.

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

NOTE

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

Laser cauterization

WARNING

- Performing treatment while the intestines are filled with a flammable gas could result in an explosion and/or serious patient injury. If the intestines contain a flammable gas, replace it with air or a non-flammable gas such as CO_2 before performing laser cauterization.
- To avoid patient injury and/or damage to the endoscope, never emit laser radiation before confirming that an appropriate distance between the target and the endoscope's distal end is maintained and the tip of the laser probe is in the correct position in the endoscopic image.

CAUTION

- Before inserting or withdrawing the laser probe, return the UP/DOWN and RIGHT/LEFT angulation control knobs to their neutral positions so that the bending section will be straight. If it is bent, there is a danger of damaging the instrument channel.
- 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.

4.3 Withdrawal of the endoscope

1. Aspirate accumulated air, blood, mucous or other debris by depressing the suction valve.
2. Turn the UP/DOWN and RIGHT/LEFT angulation locks to the "F▶" position to release them.
3. Carefully withdraw the endoscope while observing the endoscopic image.
4. Remove the mouthpiece from the patient's mouth (for GIF models only).

4.4 Transportation of the endoscope

Transporting within the hospital

When carrying the endoscope by hand, hold the endoscope connector together with the control section in one hand and hold the distal end of the insertion tube securely, but lightly without squeezing, in the other hand as shown in Figure 4.5.

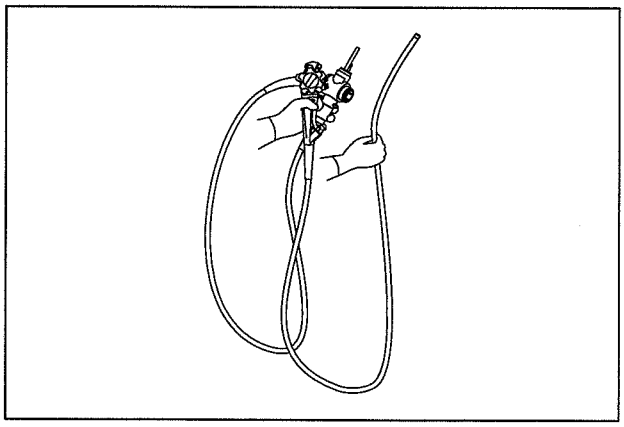


Figure 4.5

NOTE

If the auxiliary water tube is connected to auxiliary water inlet, attach the clip of the auxiliary water tube to universal cord as shown in Figure 4.6.

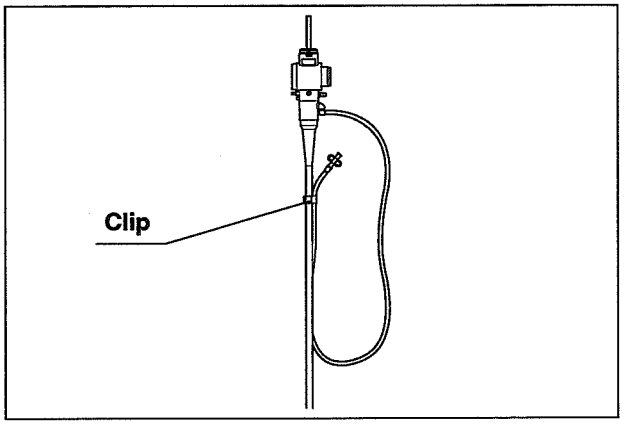


Figure 4.6

Transporting outside the hospital

Transport the endoscope in the carrying case.

CAUTION

- The carrying case cannot be cleaned or disinfected. Clean and disinfect or sterilize the endoscope before placing it in the carrying case. Disinfect or sterilize the endoscope again before use.
- Do not attach the water-resistant cap when transporting the endoscope, to avoid damage to the endoscope caused by changes in air pressure.
- Before putting the endoscope in the carrying case, always make sure that the insertion tube is set to the maximum flexibility. Putting the endoscope in the carrying case while the insertion tube is rigid could damage the endoscope.

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.

5.1 Troubleshooting guide

Endoscope functions

○ Angulation

Irregularity description	Possible cause	Solution
Resistance when rotating angulation control knob(s).	Angulation lock(s) is (are) engaged.	Rotate angulation lock(s) in the "F▶" direction.

○ Air/water feeding

Irregularity description	Possible cause	Solution
No air feeding.	Air pump is not operating.	Press the LOW, MED or HIGH button on the light source as described in the light source's instruction manual.
	Air/water valve is damaged.	Replace it with a new air/water valve.
No water feeding.	Air pump is not operating.	Press the LOW, MED or HIGH button on the light source as described in the light source's instruction manual.
	There is no sterile water in the water container.	Fill 2/3 full with sterile water.
	Air/water valve is damaged.	Replace it with a new air/water valve.
Sticky air/water valve.	Air/water valve is dirty.	Remove the air/water valve. Reprocess the air/water valve and then attach it again.
	Air/water valve is damaged.	Replace it with a new air/water valve.
Air/water valve cannot be attached.	Improper air/water valve is used.	Use a correct air/water valve.
	Air/water valve is damaged.	Replace it with a new air/water valve.

Suction

Irregularity description	Possible cause	Solution
Absent or insufficient suction.	Biopsy valve is not attached properly.	Attach it correctly.
	Biopsy valve is damaged.	Replace it with a new biopsy valve.
	Suction pump is not set properly.	Adjust the suction pump's setting as described in its instruction manual.
	Suction valve is damaged.	Replace it with a new suction valve.
Suction valve is sticky.	Suction valve is dirty.	Remove the suction valve. Reprocess the suction valve and then attach it again.
	Suction valve is damaged.	Replace it with a new suction valve.
Suction valve cannot be attached.	Suction valve is damaged.	Replace it with a new suction valve.
	Improper suction valve is used.	Use a correct suction valve.

Image quality or brightness

Irregularity description	Possible cause	Solution
No video image.	Not all power switches are ON.	Turn ON all the power switches.
Image is not clear.	The objective lens is dirty.	Feed water to remove mucous, etc.
Excessively dark or bright image.	The light source is not set properly.	Adjust the light source's setting as described in its instruction manual.

Flexibility adjustment

Irregularity description	Possible cause	Solution
Too strong to turn the flexibility adjustment ring.	The insertion tube is looped.	Straighten the insertion tube.

Auxiliary water feeding

Irregularity description	Possible cause	Solution
Auxiliary water inlet cap is leaking.	Auxiliary water inlet cap is worn out.	Replace it with a new auxiliary water inlet cap.
	Auxiliary water inlet cap is incorrectly installed.	Install auxiliary water inlet cap correctly.

Endo-therapy accessories

Irregularity description	Possible cause	Solution
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
Remote switch does not work.	Wrong remote switch is operated.	Operate the correct remote switch.
	The remote switch function has been set improperly.	Set the remote switch function correctly.

5.2 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 55.

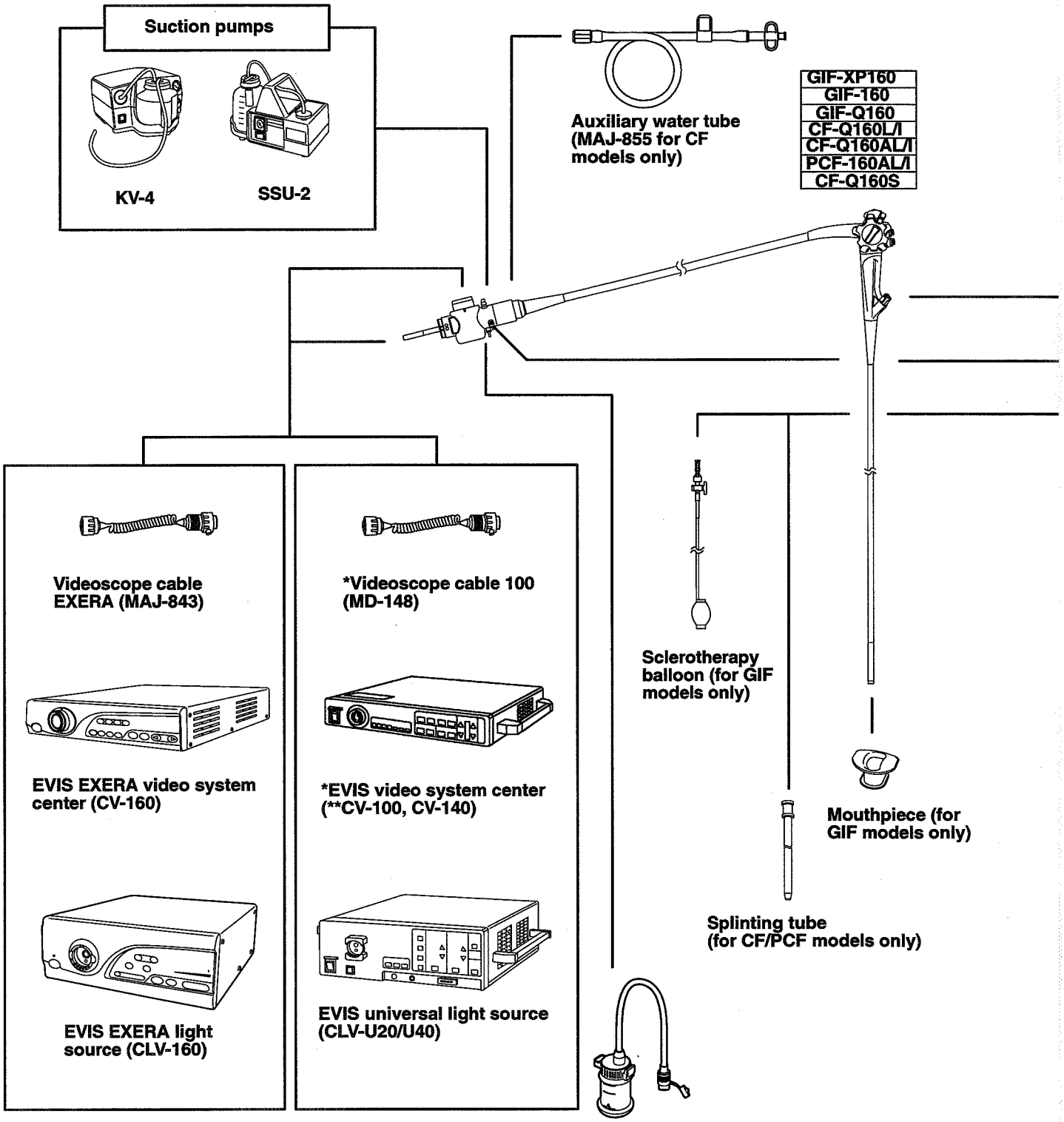
Appendix

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.



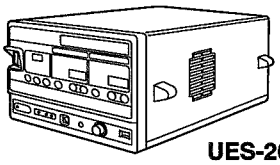
*not compatible with GIF-XP160

**CV-100 is not compatible with GIF-Q160, CF-Q160L/I, CF-Q160AL/I, CF-Q160S.

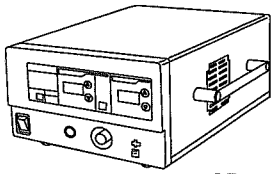
***Use a non-flammable gas

Biopsy valve (MB-358)

Electrosurgical units



UES-20/30



PSD-10/20

Endo-therapy accessories

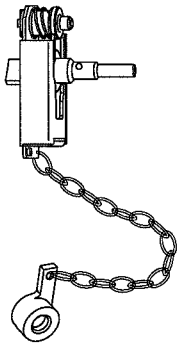
See next page.

Electrosurgical accessories

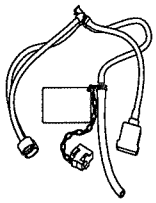
See next page.

Sclerotherapy tube (for GIF models only)

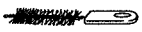
Cleaning and disinfection equipment



Channel plug (MH-944)

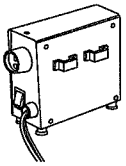


Injection tube (MH-946)



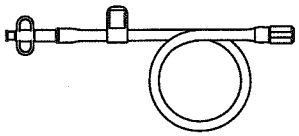
Channel-opening cleaning brush (MH-507)

Ultrasonic cleaner (KS-2/3)

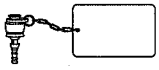


Maintenance unit (MU-1)

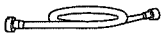
Channel cleaning brush (BW-20T)



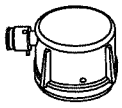
Auxiliary water tube (MAJ-855)



AW channel cleaning adapter (MH-948)



Suction cleaning adapter (MH-856)



Water-resistant cap (MH-553)

Leakage tester (MB-155)

EVIS EXERA video system center/EVIS video system centers

ENDOSCOPE	Videoscope cable 100		Videoscope cable EXERA
	CV-100	CV-140	CV-160
GIF-XP160	—	—	○
GIF-160	○	○	○
GIF-Q160	—	○	○
CF-Q160L/I	—	○	○
CF-Q160AL/I	—	○	○
PCF-160AL/I	○	○	○
CF-Q160S	—	○	○

○ applicable — not applicable

Accessories

ENDOSCOPE	Mouthpiece		Sclerotherapy balloon		Sclerotherapy tube
	MB-142	MA-474	MD-689	MD-692	ST-E1
GIF-XP160	○	○	—	—	○
GIF-160	○	—	○	—	○
GIF-Q160	○	—	—	○	○

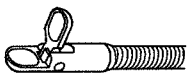
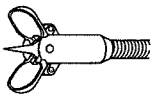
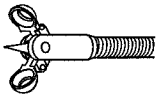
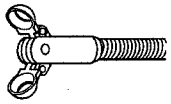
○ applicable — not applicable

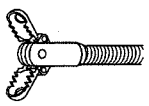
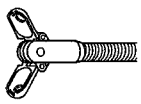
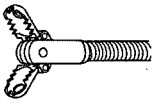
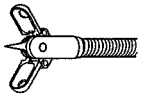
Accessories for CF/PCF models only

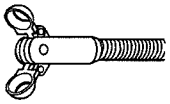
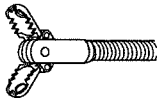
ENDOSCOPE	Splinting tube			
	ST-C3	ST-C3S	ST-C5	ST-C8
CF-Q160L/I	○	○	—	○
CF-Q160AL/I	○	○	—	○
PCF-160AL/I	—	—	○	—
CF-Q160S	—	—	—	—

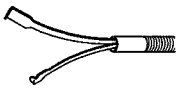
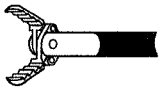
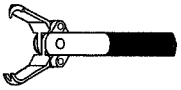
○ applicable — not applicable

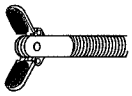
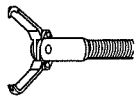
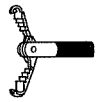
Endo-therapy accessories

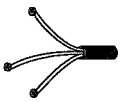
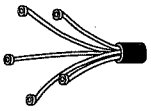
	BIOPSY FORCEPS			
	Alligator type	With needle	Fenestrated with needle	Fenestrated
				
GIF-XP160	–	–	FB-34K-1	FB-19K-1/21K-1
GIF-160	FB-11K-1	–	FB-23K-1/24K-1	FB-25K-1
GIF-Q160	FB-11K-1	–	FB-23K-1/24K-1	FB-25K-1
CF-Q160L	FB-7U-1	FB-13U-1	FB-24U-1/50U-1	FB-28U-1
CF-Q160I	FB-7U-1	FB-13Q-1	FB-24Q-1/50Q-1	FB-28R-1
CF-Q160AL	FB-7U-1	FB-13U-1	FB-24U-1/50U-1	FB-28U-1
CF-Q160AI	FB-7U-1	FB-13Q-1	FB-24Q-1/50Q-1	FB-28R-1
PCF-160AL	FB-7U-1	–	FB-24U-1	FB-28U-1
PCF-160AI	FB-7U-1	–	FB-24Q-1	FB-28R-1
CF-Q160S	FB-11K-1	FB-13E-1	FB-23K-1/24E-1/ 50K-1	FB-25K-1

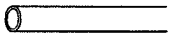
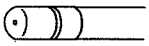
	BIOPSY FORCEPS			ROTATABLE BIOPSY FORCEPS
	Alligator jaws	Rat tooth	Rat tooth with alligator jaws (Swinging type)	Fenestrated with needle
				
GIF-XP160	FB-15K-1	–	FB-52K-1	–
GIF-160	FB-36K-1	FB-37K-1	FB-53K-1 to 55K-1	FB-24KR-1
GIF-Q160	FB-36K-1	FB-37K-1	FB-53K-1 to 55K-1	FB-24KR-1
CF-Q160L	–	FB-37U-1	FB-53U-1/54U-1	–
CF-Q160I	–	FB-37U-1	FB-53Q-1/54Q-1	–
CF-Q160AL	–	FB-37U-1	FB-53U-1/54U-1	–
CF-Q160AI	–	FB-37U-1	FB-53Q-1/54Q-1	–
PCF-160AL	–	FB-37U-1	FB-53U-1/54U-1	–
PCF-160AI	–	FB-37U-1	FB-53Q-1/54Q-1	–
CF-Q160S	FB-36K-1	FB-37K-1	FB-53K-1 to 55K-1	FB-24KR-1

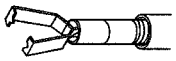
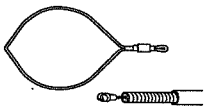
	ROTATABLE BIOPSY FORCEPS		CYTOLOGY BRUSH	
	Fenestrated	Rat tooth with alligator jaws (Swinging type)	Standard type	With sheath
				
GIF-XP160	FB-19KR-1	–	BC-1J	BC-5K
GIF-160	FB-25KR-1	FB-53KR-1 to 55KR-1	BC-2J	BC-9L
GIF-Q160	FB-25KR-1	FB-53KR-1 to 55KR-1	BC-2J	BC-9L
CF-Q160L	–	–	BC-2T	–
CF-Q160I	–	–	BC-2T	–
CF-Q160AL	–	–	BC-2T	–
CF-Q160AI	–	–	BC-2T	–
PCF-160AL	–	–	BC-2T	–
PCF-160AI	–	–	BC-2T	–
CF-Q160S	FB-25KR-1	FB-53KR-1 to 55KR-1	BC-2J	BC-9L

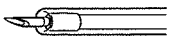
	GRASPING FORCEPS			
	W shape jaw	Alligator jaws	Rat tooth	Pelican type
				
GIF-XP160	FG-4L-1	–	FG-14P-1	–
GIF-160	FG-4L-1	FG-6L-1	FG-8L-1/48L-1 /50L-1	–
GIF-Q160	FG-4L-1	FG-6L-1	FG-8L-1/48L-1 /50L-1	–
CF-Q160L	–	FG-7U-1	FG-9U-1	FG-10U to 13U
CF-Q160I	–	FG-7U-1	FG-9U-1	FG-10U to 13U
CF-Q160AL	–	FG-7U-1	FG-9U-1	FG-10U to 13U
CF-Q160AI	–	FG-7U-1	FG-9U-1	FG-10U to 13U
PCF-160AL	–	FG-6U-1	FG-8U-1	–
PCF-160AI	–	FG-6U-1	FG-8U-1	–
CF-Q160S	FG-4L-1	FG-7L-1	FG-9L-1/48L-1/ 50L-1	FG-10L to 13L

	GRASPING FORCEPS	GRASPING FORCEPS		
	Basket type	Rubber tips (Non-latex)	Sharp tooth	Rat tooth with alligator jaws
				
GIF-XP160	FG-17K-1	FG-20P-1	–	–
GIF-160	FG-16L-1	FG-21L-1	FG-32L-1	FG-42L-1/47L-1 /49L-1
GIF-Q160	FG-16L-1	FG-21L-1	FG-32L-1	FG-42L-1/47L-1 /49L-1
CF-Q160L	FG-16U-1	–	–	–
CF-Q160I	FG-16U-1	–	–	–
CF-Q160AL	FG-16U-1	–	–	–
CF-Q160AI	FG-16U-1	–	–	–
PCF-160AL	FG-16U-1	–	–	–
PCF-160AI	FG-16U-1	–	–	–
CF-Q160S	FG-16L-1	FG-21L-1	FG-32L-1	FG-42L-1/47L-1 /49L-1

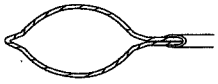
	GRASPING FORCEPS	GRASPING FORCEPS	SUTURE CUTTING FORCEPS	SURGICAL SCISSORS
	Tripod type	Pentapod type		
				
GIF-XP160	–	–	–	–
GIF-160	FG-45L-1	FG-46L-1	FS-1K	FS-3L-1
GIF-Q160	FG-45L-1	FG-46L-1	FS-1K	FS-3L-1
CF-Q160L	FG-45U-1	FG-46U-1	–	–
CF-Q160I	FG-45U-1	FG-46U-1	–	–
CF-Q160AL	FG-45U-1	FG-46U-1	–	–
CF-Q160AI	FG-45U-1	FG-46U-1	–	–
PCF-160AL	FG-45U-1	FG-46U-1	–	–
PCF-160AI	FG-45U-1	FG-46U-1	–	–
CF-Q160S	FG-45L-1	FG-46L-1	FS-1K	FS-3L-1/FS-4L

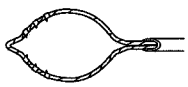
	LOOP CUTTER	MAGNETIC EXTRACTOR	WASHING PIPE	
			Standard type	Spray type
				
GIF-XP160	–	IE-2P	PW-2L-1	PW-6P-1
GIF-160	FS-5L-1	IE-1L	PW-1L-1	PW-5L-1
GIF-Q160	FS-5L-1	IE-1L	PW-1L-1	PW-5L-1
CF-Q160L	FS-5U-1	–	PW-1V-1	PW-5V-1
CF-Q160I	FS-5Q-1	–	PW-1V-1	PW-5V-1
CF-Q160AL	FS-5U-1	–	PW-1V-1	PW-5V-1
CF-Q160AI	FS-5Q-1	–	PW-1V-1	PW-5V-1
PCF-160AL	FS-5U-1	–	PW-1V-1	PW-5V-1
PCF-160AI	FS-5Q-1	–	PW-1V-1	PW-5V-1
CF-Q160S	FS-5L-1	IE-1L	PW-1H-1	PW-5L-1

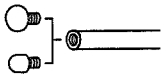
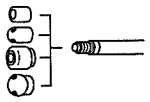
	MEASURING DEVICE	MEASURING DEVICE	ROTATABLE CLIP FIXING DEVICE	LIGATING DEVICE
	Straight	Bendable		
				
GIF-XP160	M1-2K	M2-4K	–	–
GIF-160	M1-2K	M2-4K	HX-5LR-1	HX-20L-1
GIF-Q160	M1-2K	M2-4K	HX-5LR-1	HX-20L-1
CF-Q160L	M1-2U	M2-3U	HX-6UR-1	HX-20U-1
CF-Q160I	M1-2U	M2-3U	HX-5QR-1/6UR-1	HX-20Q-1
CF-Q160AL	M1-2U	M2-3U	HX-6UR-1	HX-20U-1
CF-Q160AI	M1-2U	M2-3U	HX-5QR-1/6UR-1	HX-20Q-1
PCF-160AL	M1-2U	M2-3U	HX-6UR-1	HX-20U-1
PCF-160AI	M1-2U	M2-3U	HX-5QR-1/6UR-1	HX-20Q-1
CF-Q160S	M1-2K	M2-4K	HX-5LR-1/6UR-1	HX-20L-1

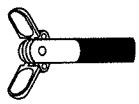
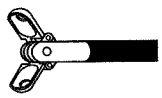
	INJECTOR	DISPOSABLE INJECTOR	HEAT PROBE
			
GIF-XP160	NM-3K/8L-1/9L-1	NM-201L	–
GIF-160	NM-1K/4L-1 to 9L-1	NM-200L to 201L	CD-20Z/120U
GIF-Q160	NM-1K/4L-1 to 9L-1	NM-200L to 201L	CD-20Z/120U
CF-Q160L	NM-4UL-1	–	CD-10Z/20Z/120U
CF-Q160I	NM-4UL-1	–	CD-10Z/20Z/120U
CF-Q160AL	NM-4UL-1	–	CD-10Z/20Z/120U
CF-Q160AI	NM-4UL-1	–	CD-10Z/20Z/120U
PCF-160AL	NM-4UL-1	–	CD-20Z/120U
PCF-160AI	NM-4UL-1	–	CD-20Z/120U
CF-Q160S	NM-4L-1 to 7L-1	–	CD-10Z/20Z/120U

Electrosurgical accessories

	ELECTROSURGICAL SNARE			
	Crescent	Hexagonal	Oval	Mini oval
				
GIF-XP160	SD-7P-1	SD-8P-1	–	–
GIF-160	SD-5L-1	SD-6L-1	SD-9L-1/11L-1	SD-12L-1/13L-1
GIF-Q160	SD-5L-1	SD-6L-1	SD-9L-1/11L-1	SD-12L-1/13L-1
CF-Q160L	SD-5U-1	SD-6U-1	SD-9U-1/11U-1	SD-12U-1/13U-1
CF-Q160I	SD-5U-1	SD-6U-1	SD-9U-1/11U-1	SD-12U-1/13U-1
CF-Q160AL	SD-5U-1	SD-6U-1	SD-9U-1/11U-1	SD-12U-1/13U-1
CF-Q160AI	SD-5U-1	SD-6U-1	SD-9U-1/11U-1	SD-12U-1/13U-1
PCF-160AL	SD-5U-1	SD-6U-1	SD-9U-1/11U-1	SD-12U-1/13U-1
PCF-160AI	SD-5U-1	SD-6U-1	SD-9U-1/11U-1	SD-12U-1/13U-1
CF-Q160S	SD-5L-1	SD-6L-1	SD-9L-1/11L-1	SD-12L-1/13L-1

	ELECTROSURGICAL SNARE		DISPOSABLE SNARE	
	Oval with thorn	Mini oval with thorn	Oval	Mini oval
				
GIF-XP160	–	–	–	–
GIF-160	SD-16L-1	SD-17L-1	SD-210L-25	SD-210L-15
GIF-Q160	SD-16L-1	SD-17L-1	SD-210L-25	SD-210L-15
CF-Q160L	SD-16U-1	SD-17U-1	SD-210U-25	SD-210U-15
CF-Q160I	SD-16U-1	SD-17U-1	SD-210U-25	SD-210U-15
CF-Q160AL	SD-16U-1	SD-17U-1	SD-210U-25	SD-210U-15
CF-Q160AI	SD-16U-1	SD-17U-1	SD-210U-25	SD-210U-15
PCF-160AL	SD-16U-1	SD-17U-1	SD-210U-25	SD-210U-15
PCF-160AI	SD-16U-1	SD-17U-1	SD-210U-25	SD-210U-15
CF-Q160S	SD-16L-1	SD-17L-1	SD-210L-25	SD-210L-15

	DISPOSABLE SNARE		COAGULATION ELECTRODE	
	Extra mini oval	Crescent	Ball point	Suction type
				
GIF-XP160	–	SD-221L-25	CD-5P	–
GIF-160	SD-210L-10	SD-221L-25	CD-1L	CD-3L
GIF-Q160	SD-210L-10	SD-221L-25	CD-1L	CD-3L
CF-Q160L	SD-210U-10	SD-221U-25	CD-2U	CD-4U
CF-Q160I	SD-210U-10	SD-221L-25	CD-2U	CD-4U
CF-Q160AL	SD-210U-10	SD-221U-25	CD-2U	CD-4U
CF-Q160AI	SD-210U-10	SD-221L-25	CD-2U	CD-4U
PCF-160AL	SD-210U-10	SD-221U-25	CD-1U	CD-3U
PCF-160AI	SD-210U-10	SD-221L-25	CD-1U	CD-3U
CF-Q160S	SD-210L-10	SD-221L-25	CD-2L	CD-4L

	HOT BIOPSY FORCEPS	DISPOSABLE HOT BIOPSY FORCEPS	ELECTROSURGICAL KNIFE
			
GIF-XP160	–	–	–
GIF-160	FD-1L-1	FD-5L	KD-1L-1
GIF-Q160	FD-1L-1	FD-5L	KD-1L-1
CF-Q160L	FD-2U-1	FD-5U	–
CF-Q160I	FD-2U-1	FD-5U	–
CF-Q160AL	FD-2U-1	FD-5U	–
CF-Q160AI	FD-2U-1	FD-5U	–
PCF-160AL	FD-2U-1	FD-5U	–
PCF-160AI	FD-2U-1	FD-5U	–
CF-Q160S	FD-2L-1	FD-5L	KD-1L-1