

TK-VÆTKIT

User Manual

Veterinary Portable Gastrointestinal Endoscope

VEG-15/VEC-15 Series



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®

TK VETKIT CO., LTD

Product Information

- Product model : VEG-15/VEC-15 Series
- Product name : Veterinary Portable Gastrointestinal Endoscope
- Production date : See the product label
- Manufacturer : TK VETKIT CO., LTD.
- Manufacturer's address : Room 301,3F,Plant 1,No. 199, Shui'an 1st Road,
Xiangzhou District, Zhuhai, China
- After-sales service organization : TK VETKIT CO., LTD.

CE mark



Version Information

The version number of this Manual is subject to update at any time due to changes in software or technical specifications without prior notice. Version of this Manual:

- Version No.: A 1.0

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Statement

The manufacturer owns the copyright of this non-publicly published user manual and has the right to treat it as confidential information. This User Manual is intended only as a reference for the operation, maintenance and repair of the product and no other person has the right to disclose it to others.

The User Manual of this product contains proprietary information protected by copyright law. All rights reserved. No part of the User Manual may be photocopied, reproduced or translated into other languages without the written consent of the manufacturer.

The contents of the User Manual of this product are subject to change without notice.

This product is only used for endoscopy and treatment of small and medium-sized animals, and the operator shall be liable for any adverse consequences that are not related to the intended use.

Manufacturer's Responsibilities

The manufacturer will assume responsibilities for the safety, reliability and performance of the product if all of the following conditions are met:

- The installation, maintenance or upgrading of the product shall be carried out by personnel authorized or approved by the manufacturer;
- The storage environment, operating environment and electrical environment of the product meet the product specifications;
- This product is used in accordance with the *User Manual*.

Abstract of Manual

◆ Primary structure

The Veterinary Portable Gastrointestinal Endoscope mainly consists of an operation section, a veterinary endoscopic image processor and accessories. There are three models of the veterinary endoscopic image processor, i.e., VHU-1405, D-2322 and VHP-1315.

◆ Scope of application

It is applicable to the examination and treatment of the respiratory tract, digestive tract, urethra and other parts of animals.

◆ Cautions, warnings and informative instructions

- 1) There are no user-serviceable components inside this product. The internal maintenance of the equipment must be carried out by the technical maintenance personnel authorized by the manufacturer.
- 2) This product is not a medical device for human use and shall not be used for medical activities on humans.
- 3) Unplug the supporting equipment before cleaning this product.
- 4) Operate in strict accordance with the User Manual provided by the manufacturer.

About This Manual

This Manual describes in detail the use, functionality and operation method of the product. Read and understand the contents in this Manual carefully before using this product to ensure proper use of this product and to ensure the safety of animals and users.

This Manual describes the product in its most complete configuration, so some of the contents may not apply to the product you have purchased. If you have any questions, please contact us.

Please keep this Manual near the product so that it can be easily and promptly accessed when

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needed.

This Manual is suitable for professional animal clinical medical staff to read. Readers shall have the knowledge and work experience in medical procedures, practices, and terminology necessary for endoscope.

All illustrations provided in this Manual are for reference only and the settings or data in the illustrations may not exactly match the actual display you see on the product.

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Identification Description

The symbols that appear on this packaging, the back cover of this Manual or in this product are described as follows:



Keep dry



Fragile, handle with care



This way up



Stacking limit by 5

Key Points (Instructions Before Use)

Intended Purpose

This product is used for endoscopy and treatment of small and medium-sized animals.

Scope of Application

It is applicable to the examination and treatment of the respiratory tract, digestive tract, urethra and other parts of animals.

User Manual

This User Manual contains basic information on the safe and effective use of this product. Be sure to carefully read this User Manual and the user manuals for other instruments before use, and make operations according to the regulations.

Keep all relevant user manuals in a safe and easily accessible place. If you have any questions or comments about the contents of the User Manual of this product, please contact us.

This Manual describes product of the top configuration, and the functional configuration of the product is subject to the actual model.

User Qualification

The operator of this product must be a physician qualified as a licensed veterinarian as defined by the Ministry of Agriculture of the PRC, or a physician designated by the department director using the product according to the difficulty of the technique used who can safely perform the established operation in accordance with official regulations.

Supporting Equipment

Refer to “Check of Items” in Chapter 1 to validate whether this product is compatible with the supporting equipment in use. The use of incompatible equipment may cause injury to the animals or operators or damage to the equipment.

Cleaning, Disinfection and Sterilization Before Initial Use/Cleaning, Disinfection, Sterilization and Storage After Use

This product has not been cleaned, disinfected or sterilized before shipment. Before initial use, cleaning, disinfection and sterilization shall be performed as described from Chapter 5 “Cleaning, Disinfection and Sterilization: General” to Chapter 7 “Cleaning, Disinfection and Sterilization Procedures”.

After use, cleaning, disinfection, sterilization and storage shall be performed as described from Chapter 5 “Cleaning, Disinfection and Sterilization: General” to Chapter 8 “Storage, Handling and Disposal Outside the Hospital”. Inadequate cleaning, disinfection and sterilization or improper storage may result in a risk of infection and lead to equipment damage or reduced performance.

Spare Equipment

Be sure to have spare equipment or equipment with similar functions to avoid accidents when the equipment fails or malfunctions during operation.

Maintenance

The failure rate of this product and supporting equipment increases with the number of operations and cumulative time in use. In addition to the check before each use, the personnel responsible for the maintenance of veterinary instruments shall also regularly check the components mentioned in this User Manual. If an abnormality is observed in the endoscope, do not use it. It shall be checked as described in Section 10.1 “Troubleshooting Guide”. If the abnormality is still observed after inspection, please contact us.

Improper Repair and Modification Prohibited

This product does not contain any user-serviceable components. Do not disassemble, modify, or attempt to repair. Otherwise, it may cause injury to the animals or damage to the equipment.

Equipment that has been disassembled, repaired or modified by non-authorized technicians are not covered by our warranty and no longer enjoy any form of warranty service.

Interface Connection Description

This product is equipped with a USB interface. The veterinary endoscope can be connected to the USB interface of a computer via a USB video adapter cable.

The memory card slot of the veterinary endoscopic image processor used in conjunction with this product is suitable for SD memory cards. The VHU-1405 veterinary endoscopic image processor can support the insertion of standard Micro SD cards with a maximum capacity of 128G (inclusive).

Symbol Description

The following symbols are used in this User Manual:

Danger	It indicates an urgent and dangerous situation. If not avoided, it may lead to death or serious injury.
Warning	It indicates a potential hazard. If not avoided, it may lead to death or serious injury.
Caution	It indicates a potential hazard. If not avoided, it may result in minor or moderate injury. It is also used as a warning against unsafe operations or potential equipment damage.
Description	It indicates additional help information.

Warnings and Precautions

Before using this product, strictly observe the following warnings and precautions.

Supplementary information will be available in the subsequent chapters.

Danger

- The application scope of this veterinary endoscope is limited to small and medium-sized animals only. It cannot be used for human medical examinations, otherwise there will be unpredictable risks.
- Do not install and operate the veterinary endoscopic image processing device in the following places.
 - Areas with excessively high oxygen concentration;
 - Places where there are oxidants (such as nitrous oxide (N₂O)) in the air;
 - Places where flammable gases are present in the air;
 - Places where there are flammable liquids nearby;

Otherwise, as this device is not explosion-proof function, it may cause an explosion or fire.

Warning

- If liquid enters the veterinary endoscopic image processor, disconnect the power supply immediately to prevent fire or electric shock. Do not use the veterinary endoscopic image processor if the liquid has seeped in, as its internal structure may have been damaged.
- Do not insert any foreign objects into the ventilation holes of the image processing device, including endoscopic diagnostic and therapeutic accessories.
- Be sure to directly plug the power plug of the power adapter's power cord into a grounded medical-grade power socket. If the image processing device is improperly grounded, it may cause electric shock.
- Do not use a three-pin to two-pin adapter to insert the power adapter plug into a two-pin circuit. Otherwise, it may prevent correct

grounding and cause electric shock.

- Do not use an extension cord to connect the power plug of the power adapter. Otherwise, it may prevent correct grounding and cause electric shock. Otherwise, it may damage the image processing device or cause electric shock.
- After use, cleaning, disinfection, sterilization and storage shall be performed as described from Chapter 5 “Cleaning, Disinfection and Sterilization: General” to Chapter 8 “Storage, Handling and Disposal Outside the Hospital”. If the cleaning, disinfection and sterilization are not thorough or the storage is improper, it may cause cross infection or transmission among animals.
- Do not hit, bump, or drop the tip, insertion section, bending section, or operation section of the endoscope. Meanwhile, do not bend, pull or entangle the tip, insertion section, bending section, or operation section with force, otherwise the endoscope will be damaged. It may also cause the endoscopic components to fall off into the animal.
- Do not bend with force or suddenly. Do not pull, twist, or rotate angled bending section with force. Otherwise, it may cause injury to the animals and the inability to straighten the bending section during the examination.
- When the bending section is at an angle, do not insert or withdraw the insertion section of the endoscope. Otherwise, it may cause injury to the animals.
- The bending section can only be bent up or down. When inserting or withdrawing and operating the endoscope, the bending direction of the endoscope shall be fully considered. When inserting or withdrawing the endoscope, do not apply excessive force to the right or left direction. Otherwise, it may cause injury to the animals.
- When clear endoscopic images are not obtained, do not suck or operate the bending section, insert or withdraw the insertion section

of the endoscope, or use the accessories. Otherwise, it may cause injury to the animals.

- When the image is frozen, do not suck or operate the bending section, insert or withdraw the insertion section of the endoscope, or use the accessories. Otherwise, it may cause injury to the animals.
- Do not insert or withdraw the insertion section suddenly or with force. Otherwise, it may cause injury to the animals.
- When it is difficult to insert the endoscope, do not force it in. Instead, stop the operation. Forcible insertion may cause injury to the animals.
- Although the illuminating light from the tip of the endoscope is necessary for the observation and treatment of the endoscope, at the same time, the illuminating light will cause the light window to heat up and thus cause high-temperature hazards, thereby causing injury to the living tissue, such as burning of the living tissue, etc. The following precautions shall be followed during illumination.
 - Do not continue to approach for observation, or expose the tip of the endoscope to the living tissue for a long time.
 - Take the minimum level of illumination necessary for observation and treatment.
 - When the endoscope is not in use temporarily, it shall be turned off to avoid unnecessary illumination causing the temperature of the illumination window to rise.
- Do not use the endoscope if the liquid has seeped in, as its internal structure may have been damaged.
- The image processor paired with the veterinary endoscope can operate by connecting to the mains supply with a power adapter or by using an internal power supply. When there are doubts about the protective grounding of the power adapter, please use the internal power supply for operation. Please pay attention to the continuous

Caution

working hours of the fully charged internal power supply. For specific specifications, please refer to the description of Section 2.5 “Specifications”. When only powered by the internal power supply, please arrange the usage time reasonably.

- The image processor paired with the veterinary endoscope operates using an internal power supply. Please pay attention to the continuous working hours of the fully charged internal power supply. For specific specifications, please refer to the description of Section 2.4 “Specifications”. Please arrange your usage time reasonably.
- Do not make the coiled diameter of the insertion tube less than 30 cm, otherwise it will cause damage to the equipment.
- Do not try to bend the insertion section of the endoscope with force. Otherwise, it may cause damage to the insertion section.
- Do not hit the tip of the insertion section, especially the surface of the objective lens of the tip, otherwise it will cause framing failure.
- Do not twist or bend the bending section, otherwise it will cause damage to the equipment.
- Do not press the bending section with force, otherwise the rubber on the surface of the bending section will be deformed or cracked, which may cause water leak.
- If the integrity of the installation or wiring of external protective conductors is in doubt, the equipment shall be operated from the internal power supply.
- Do not open the battery/screw cap when the endoscope power is turned on. Otherwise, it may cause damage to the endoscope.

Preventive Measures for the Disappearance or Freezing of Endoscopic Images

Warning

- If the endoscopic image disappears unexpectedly, or the frozen

image cannot be restored to the real-time display working state, you must stop using the endoscope immediately and withdraw the endoscope from the animal as described in Section 9.2 “Withdrawing the Abnormal Endoscope”. In this case, continued use of accessories, manipulation of bending section, suction and insertion or withdrawal of the endoscope may cause injury to the animals.

- Please follow the following preventive measures when operating the equipment. Otherwise, the endoscopic images may disappear unexpectedly, or the frozen images cannot be recovered during the examination.
 - Do not bend, hit, or twist the insertion section or operation section. Otherwise, the endoscope may be damaged, causing water leakage or damage to the internal components, such as imaging components or circuits.
 - Before inserting the endoscope via mouth, if necessary, put a mouth guard or a guide tongue piece in the animal’s mouth to prevent the animal from accidentally biting and damaging the insertion section. Biting the insertion section may cause damage to the image lead and damage to the insertion tube.
 - Make sure that the veterinary endoscopic image processor and its accessories are removed before immersing the endoscope. Otherwise, water will enter the veterinary endoscopic image processor and may cause a short circuit. This will cause the veterinary endoscopic image processor to be damaged.
 - Do not use the endoscope if bubbles continue to emerge from the endoscope during a leak test. Otherwise, water may enter the equipment and cause a short circuit. This will cause circuit damage.

Examples of Improper Operation

Senior experts have the responsibility to teach the techniques of clinical endoscopy in detail. Only through the correct operation of the physician and reliable medical device, can the safety of animals be ensured during the endoscopy and treatment. The following are some examples of improper operation.

- During prolonged suction operations, if the tip is in contact with the mucosal surface for too long or the suction pressure is too high, it may lead to hemorrhage or injury.
- When the endoscopic field of view is not clear, insertion, withdrawal and use of accessories may cause injury to the animals.
- When the endoscopic field of view is not clear, insertion or withdrawal of the endoscope, suction, or manipulation of bending section may cause injury to the animals.

Battery, Battery Charger and Power Adapter

Operate in accordance with the following regulations to prevent battery leakage, overheating, burning, explosion, and electric shock or burning of the charger or adapter.

Warning

- This equipment uses the lithium battery and power adapter or battery charger specified by us. Please charge the battery with the specified power adapter or battery charger. Do not use any other power adapters, otherwise there will be a risk of fire or electric shock.
- Do not heat or burn the battery or the entire veterinary endoscopic image processor, otherwise there is a risk of fire.
- Please be careful when handling or storing batteries to prevent the electrodes from coming into contact with metal objects and causing short circuits.
- When using power adapters or battery chargers, it is necessary to pay attention to waterproofing to prevent electric shock.

Caution

- Do not store the veterinary endoscopic image processor or power adapter in a high-temperature environment with direct sunlight, hot containers, near heat sources, or close to heat sources.
- If battery fluid accidentally gets into your eyes, rinse immediately with cold running water and seek medical attention right away.
- Please power the product with the specified power adapter. Do not use any other power adapters. Please charge the battery with the specified battery charger. Do not use any other battery chargers. To prevent battery leakage, overheating or fire or explosion, only the recommended batteries shall be used.
- Operate the product carefully in accordance with the User Manual to prevent battery leakage or damage to its terminal.
- Always keep the battery, battery charger and power adapter dry.
- When it is necessary to replace the internal battery of the image processor, please replace it with the battery recommended by us to prevent battery leakage, overheating or the risk of fire and explosion.
- If the battery still shows as uncharged within the specified time, please stop using it as the battery may have been damaged.
- If the battery charger or power adapter has cracks, deformations or damages, do not continue to use it.
- Do not strongly shake or continuously vibrate the power adapter or battery charger.
- If water gets into the power adapter or battery charger, do not continue to use it.
- Before connecting the power adapter, veterinary endoscopic image processor and operating handle, be sure to carefully check whether the power adapter is cracked, deformed or has any other abnormalities.
- After turning off the equipment, be sure to remove the connections of the power adapter, veterinary endoscopic image processor and

endoscopic operating handle from the equipment.

- Do not hold the power adapter and veterinary endoscopic image processor with a wet hand. If the power adapter and veterinary endoscopic image processor become wet or greasy, it may cause internal failure of the equipment. Please wipe the power adapter and veterinary endoscopic image processor carefully with a dry cloth before use.
- Do not use the power adapter and veterinary endoscopic image processor if there is a liquid leak. If used continuously, it may cause a fire. Please handle this battery in an appropriate manner.
- Do not use a portable transformer. Otherwise, the power adapter will be damaged.
- Generally speaking, battery performance will temporarily decline as the ambient temperature drops. When this equipment is used in a cold environment, the performance of the battery will also recover when the temperature returns to normal.
- Body oil, dirt or dust on the contact heads of the power adapter and veterinary endoscopic image processor may cause poor contact. Please wipe the product carefully with dry cloth before use.
- The veterinary endoscopic image processor contains batteries. During disposal, it is essential to operate in accordance with local laws and regulations.
- When the battery power is exhausted and the battery is not charged in time, it may cause the equipment to shut down without showing a battery power warning.
- Using the functions of this product while it is charging will accordingly extend the time it takes to fully charge.
- The power consumption of endoscopes varies depending on the functions used.
- The built-in battery of the newly purchased product is not fully

Description

charged. Please confirm the battery level of the product before use and charge it in a timely manner.

- To charge this product properly and safely, please read the User Manual carefully before use.
- When using the equipment for the first time or again after a long period of non-use, be sure to charge the battery.

LED Light Source

The LED is built into this equipment and is basically safe for the eyes. However, prolonged direct viewing of the light emitted by the LED may damage the eyes. Maintenance personnel, sales personnel, and other relevant individuals should read this Manual carefully.

Warning

- Failure to use the control or adjustment device or to perform each procedure in accordance with the Manual may cause harmful radiation exposure.

Caution

- Protect the eyes or skin from direct or scattered light exposure.

Touch Screen

When using the veterinary endoscopic image processor, attention shall be paid to the maintenance of the touch screen.

Warning

- The veterinary endoscopic image processor contains a touch screen. Do not squeeze or strike it with hard objects to avoid damaging or cracking the touch screen. Handle with care.
- Prevent sharp objects from scratching to avoid damaging the conductive film of the touch screen.
- Pay attention to water resistance and oil resistance. Oil and water may affect the performance of the touch screen. When there are stains on the surface of the touch screen, use a soft cloth or absorbent cotton dipped in a small amount of alcohol to gently wipe it.

Description

- When you find that the touch screen is not functioning properly, please contact us for handling.

Memory Card

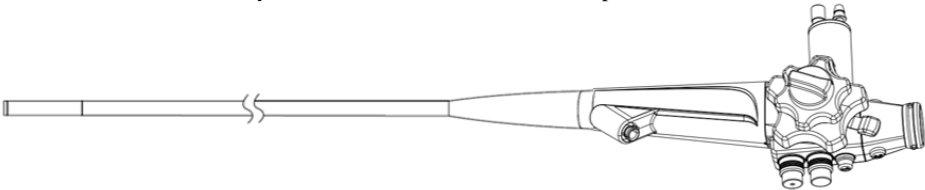
Caution

- Before using a card reader to access a memory card on a computer, perform a full disk scan of the memory card with antivirus software. Only after confirming that there are no security threats may the data be copied or accessed.
- Before reinserting the removed memory card into the veterinary endoscopic image processor, a full disk scan of the memory card shall also be conducted with antivirus software. Only after confirming that there are no security threats can it be inserted into the veterinary endoscopic image processor for use.

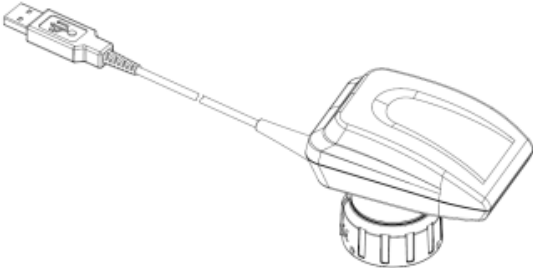
Chapter 1 Check of Items

Check the items in the carton against the figure below and verify that each item is free from damage. If you find any equipment damage, missing components or you have any questions, do not use this product, and contact us immediately. This product has not been disinfected or sterilized before shipment.

Veterinary Portable Gastrointestinal Endoscope



Veterinary Portable Gastrointestinal Endoscope (VEG-15/VEC-15 Series)

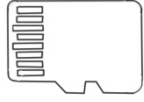
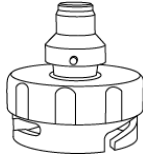
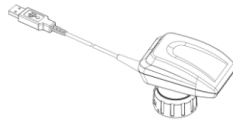


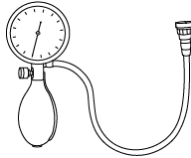

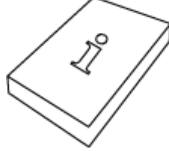

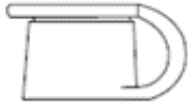
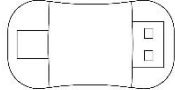


USB video adapter cable



Veterinary endoscopic image processor VHU-1405

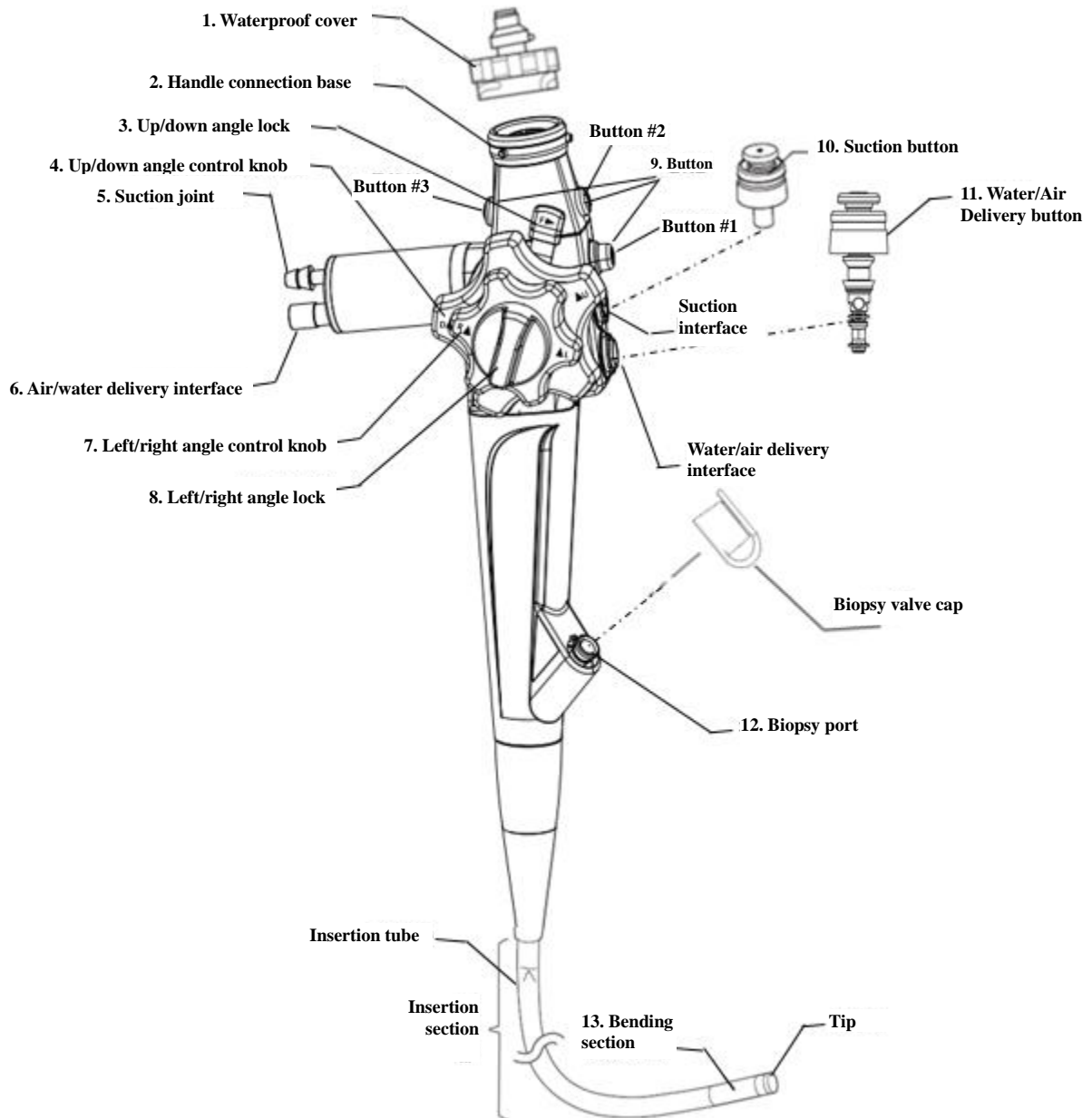
Table 1.1 List of items in the carton

Items	Diagram	Items	Diagram
Micro SD card (TF card) (standard configuration for VHU-1405)		Waterproof cover	
USB video adapter cable		Suction button	
Water/Air button		Portable leak detector	
Tube opening cleaning brush		Manual	
Tube cleaning brush		Biopsy valve cap	
Card reader (standard configuration for VHU-1405)			

Chapter 2 Names and Specifications of Components

2.1 Component Name

2.1.1 Schematic diagram of the endoscopic operating handle components



Veterinary Portable Gastrointestinal Endoscope

Figure 2.1

Schematic diagram of the video adapter cable components

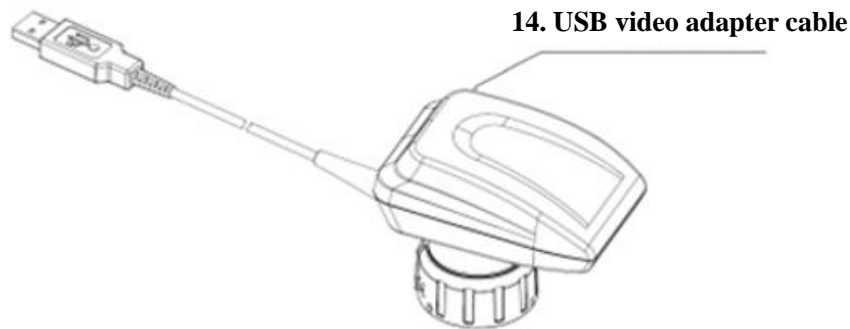


Figure 2.2

2.2 Component Function

2.2.1 Functions of the endoscopic operating handle components

1. Waterproof cover

This cover is used for sealing protection of the operating handle.

- The waterproof cover must be installed before liquid disinfection or seal test.
- The waterproof cover needs to be removed before the operating handle is connected to the main unit.
- The waterproof cover must be removed before gas disinfection.

2. Handle connection base

It is used to connect a waterproof cover or video connector.

- This base is connected to the waterproof cover before the product is conducted with liquid disinfection or seal test.
- Before the product is used, this base is connected to the video connector for transmitting image signals.

3. Up/down angle lock

When pushing towards the “F ▶” direction, unlock the up/down angle. When pushed in the opposite direction, the bending section of the endoscope can be locked to the

desired position.

4. Up/down angle control knob

When rotating in the “▲U” direction, the bending section bends upward; when rotating in the “D▲” direction, the bending section bends downward.

5. Suction joint

Connect the endoscope to the suction tube of the suction pump.

6. Air/water delivery interface

Connect the endoscope to the water bottle through a portable air pump and a water bottle's water delivery tube, and deliver water to the tip of the endoscope.

7. Left/right angle control knob

When rotating in the “R▲” direction, the bending section bends to the right; when rotating in the “▲L” direction, the bending section bends to the left.

8. Left/right angle lock

When pushing towards the “F▶” direction, unlock the left/right angle. When pushed in the opposite direction, the bending section of the endoscope can be locked to the desired position.

9. Button

The functions of the function button #1 are as follows:

- A short press can achieve the video recording function.

The functions of the function button #2 are as follows:

- A short press can take a photo of the currently displayed screen.

The functions of the function button #3 are as follows:

- Short press once to freeze the display screen, and short press again to unfreeze

the screen.

- Press and hold for 3 seconds to adjust the white balance of the image displayed by the veterinary image processor. (Available when connected to a computer)

10. Suction button

Press this button for suction. It is used to remove liquid, debris, intestinal gas or air from the body of animals.

11. Air/Water Delivery button

Blocking the small central hole can deliver air. Pressing this button can deliver water to clean the objective lens. When necessary, air can also be delivered to remove the liquid or debris adhering to the objective lens.

12. Biopsy port

This interface is an instrument channel port and its functions are as follows:

- The opening of the tube for inserting the endoscopic diagnostic and therapeutic accessories.
- Suction tube opening.
- The opening of the tube for injecting liquid (injecting from the syringe through the biopsy valve cap)

13. Bending section

The position of the tip of the endoscope can be adjusted by changing the vertical direction of the bending section by adjusting the angle handle.

14. USB video adapter cable

The USB video adapter cable connects the electrical interface of the veterinary endoscope and the USB interface of the field computer. After connection, the image signal of the veterinary endoscope is transmitted to the computer and the image is

displayed on the computer's display screen.

2.3 Specifications

2.3.1 Environmental conditions

Normal operating conditions	Ambient temperature	: 5°C~40°C
	Atmospheric pressure	: 700hPa~1100hPa
	Relative humidity	: 40%~85%
Storage and transportation	Ambient temperature	: -25°C~+50°C
	Atmospheric pressure	: 600hPa~1100hPa
	Relative humidity	: ≤90%

2.3.2 Product specifications

The specifications of the Veterinary Portable Gastrointestinal Endoscope are shown in the table

below.

Model	VEG-15N	VEG-15	VEC-15	VEC-15L
Outer diameter (±0.5mm)	5.8 mm	6.8 mm	9.2 mm	9.2 mm
Channel (±0.3mm)	2.2 mm	2.8 mm	3.2 mm	3.2 mm
Field of view (±15%)	120°	120°	120°	120°
Field of view direction	0°	0°	0°	0°
Depth of field	3~100 mm	3~100 mm	3~100 mm	3~100 mm
Up/down bending angle (±15%)	Up: 210° Down: 130°	Up: 210° Down: 130°	Up: 180° Down: 130°	Up: 180° Down: 130°
Left/right bending angle (±15%)	Left: 100° Right: 100°	Left: 100° Right: 100°	Left: 160° Right: 160°	Left: 160° Right: 160°
Working length (±10%)	1500 mm	1500 mm	1500 mm	3000 mm
Water vapor nozzle	Yes	Yes	Yes	Yes
Auxiliary water delivery	None	None	None	None

Chapter 3 Preparation and Check

Before each use, this equipment shall be prepared and inspected in accordance with the following procedures. In addition, other equipment that may be used shall be inspected in accordance with the regulations of the User Manual. If any equipment abnormality is found after the inspection, refer to Chapter 9 “Troubleshooting” for troubleshooting. If there is still a problem with the equipment, do not use this equipment and return it to us for repair in accordance with Section 9.3 “Rework of the Endoscope”.

Warning

- The use of a malfunctioning endoscope may endanger the safety of animals and lead to increased equipment damage.
- This product has not been cleaned, disinfected or sterilized before shipment. Before initial use, cleaning, disinfection and sterilization shall be performed as described from Chapter 5 “Cleaning, Disinfection and Sterilization: General” to Chapter 7 “Cleaning, Disinfection and Sterilization Procedures”.

3.1 Preparation of Equipment

Before each use, prepare the endoscope, veterinary endoscopic image processor and personal protective equipment such as goggles, mask, waterproof clothing and protective gloves according to the actual situation. Personal protective equipment shall be of appropriate size and long enough to prevent skin exposure. Please refer to the User Manual of the respective equipment.

3.2 Checking the Veterinary Endoscopic Image Processor VHU-1405

Check and assembly

Caution

- Perform a preventative inspection on the veterinary endoscopic image processor every six months at normal frequency of use or after a long period of non-use. For products with problems, please do not

repair them by yourself. Contact us for handling.

Accessory check

Check whether all accessories are in good condition. The appearance of the Micro SD card (TF card) shall have no damage or fissures, and there shall be no dirt covering the contact area.

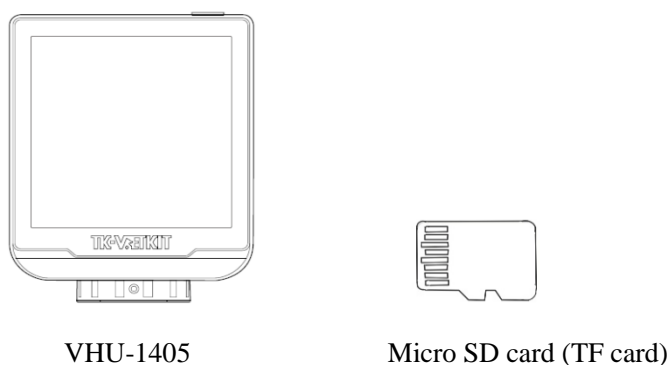


Figure 3.1

Charging the battery

Warning

- Battery chargers are non-medical electrical equipment and shall be separated from medical electrical equipment and plugged into a separate power socket. Do not clean, disinfect or sterilize the battery charger.
- Do not squeeze the battery, throw it into fire or short-circuit it.
- Battery combustion, explosion or leakage may cause personal injury.

Caution

- The battery will discharge automatically when not in use. Be sure to charge it regularly before use.
- When the battery is fully charged but its operation time still shortens, its service life may have expired. Please replace the battery with a new one.

- The battery will heat up when charging. This is not a functional abnormality.

Charging the lithium battery

Please fully charge the battery with the battery charger provided before use. For the operation of the battery charger, please refer to the charger's user manual. If the battery is damaged or its power is exhausted, please replace it immediately and properly recycle the used battery.

Please handle used batteries in accordance with local relevant regulations.

Description

- The veterinary endoscopic image processor contains a detachable lithium battery. Please pay attention to charging the battery to avoid affecting its use.

3.3 Product Assembly and Check

The specific procedures of the assembly methods between different models of endoscopes of this product and different models of the veterinary endoscopic image processor are as follows:

3.3.1 Assembly and check of VHU-1405 and endoscope

This Section explains the fit and assembly relationship between VHU-1405 and endoscope.

Connection with the endoscope

1. Install the lithium battery with sufficient power as shown in Figure 3.2 onto the battery cartridge base of the veterinary endoscopic image processor and tighten the screw cap of the battery cartridge.

Warning

- The positive and negative terminals of the battery must not be installed in reverse; otherwise, the veterinary endoscopic image processor cannot be opened and the product may be damaged.

Caution

- Foreign objects or damage inside the battery holder will cause poor contact and prevent the machine from starting.

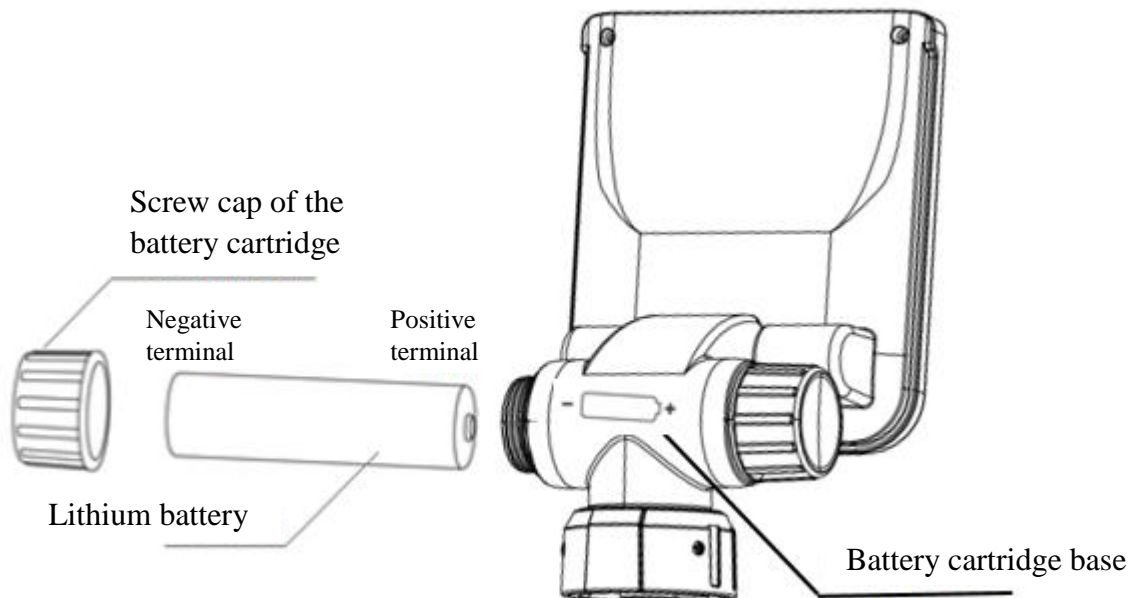


Figure 3.2

2. Remove the slot cover and install the Micro SD card (TF card) into the slot of the veterinary endoscopic image processor. Pay attention to the front and back of the Micro SD card (TF card), as shown in Figure 3.3. After the Micro SD card (TF card) is installed, push the slot cover in the original direction and insert it properly.

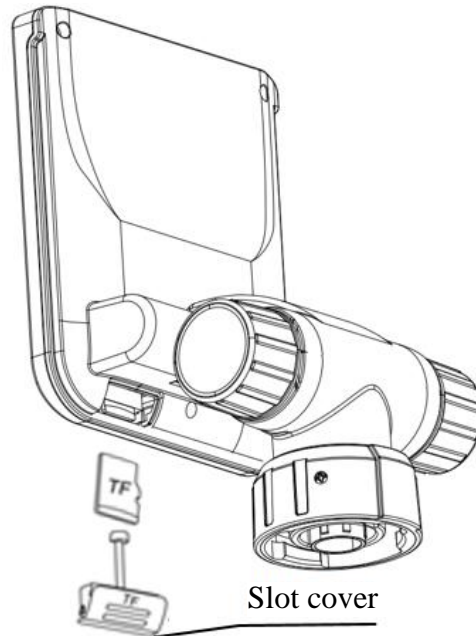


Figure 3.3

Caution

- Inserting the memory card in the wrong direction or at the wrong angle may damage the contact points and prevent the memory card from being removed.
- If the memory card is not fully inserted, correct recording may not be possible.

3. Connection between the operating handle and the veterinary endoscopic image processor.

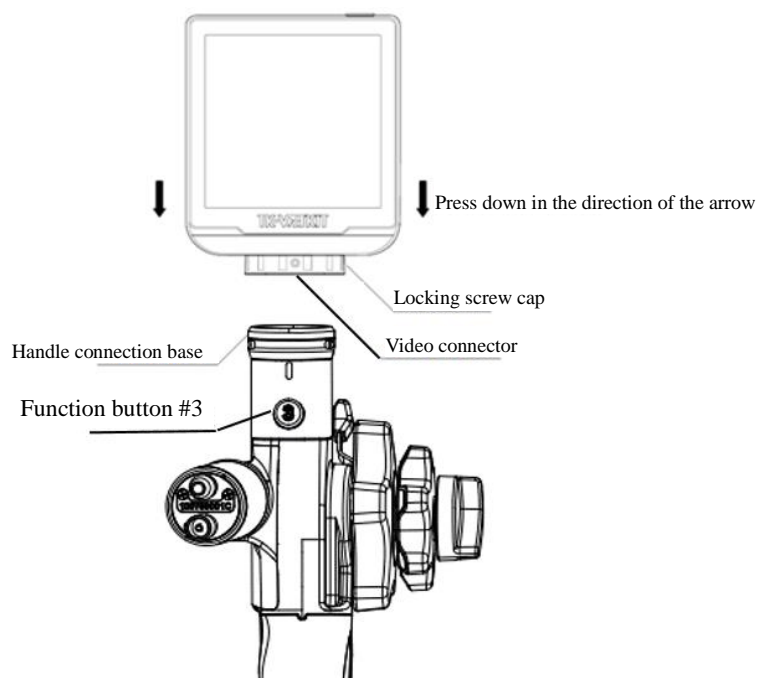


Figure 3.4

Connect the operating handle to the veterinary endoscopic image processor in the direction shown in Figure 3.4. During the assembly process, the veterinary endoscopic image processor needs to press the operating handle downward forcefully and shake it slightly left and right until the video connector is fully inserted into the handle connection base of the operating handle. Finally, tighten the locking cover of the veterinary endoscopic image processor in a clockwise direction. At this point, the connection between the veterinary endoscopic image processor and the operating handle is completed.

Checking the VHU-1405 veterinary endoscopic image processor/tip

1. Press the Power button, and the accompanying endoscopic image will appear on the LCD screen. (As shown in Figure 3.5)

Caution

- When the power cannot be turned on by short press, check the veterinary endoscopic image processor in accordance with the content of Chapter 9 “Troubleshooting”. If the power still cannot be turned on, please contact us.
- The LCD screen display shall be the real-time and real image of the

front end of the tip. If the display is not the real-time and real image of the front end of the tip, the Power button shall be pressed immediately to turn off the veterinary endoscopic image processor and contact us.

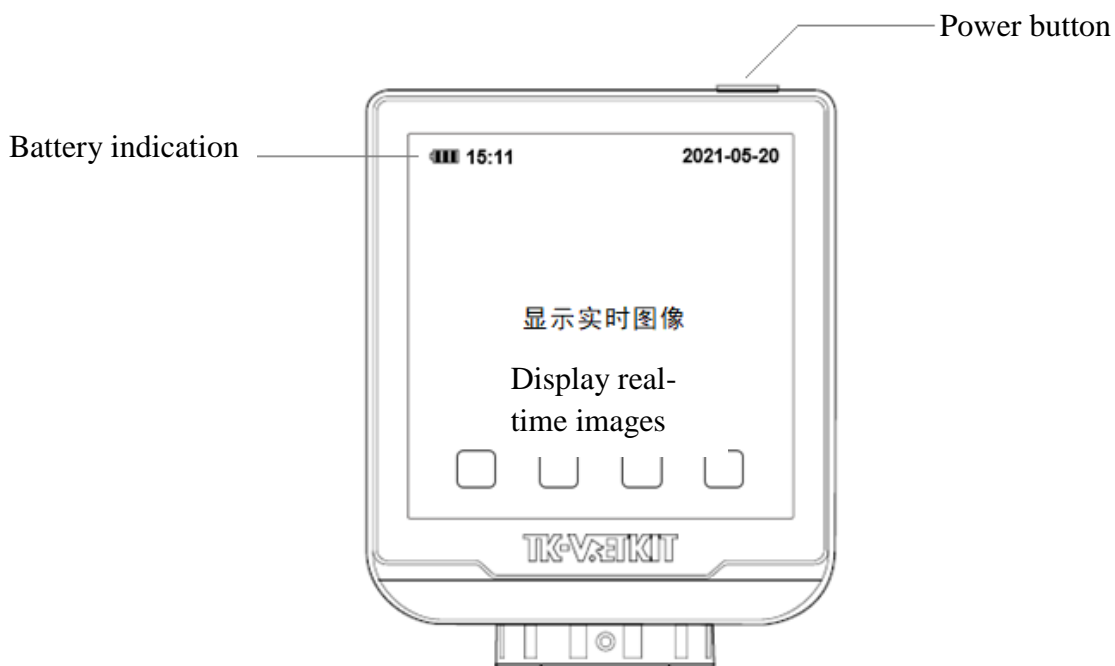






Figure 3.5

2. A few seconds after the veterinary endoscopic image processor is turned on, check the battery level indicator symbol, time and date on the veterinary endoscopic image processor.

	Full bar: The remaining battery power is sufficient, and no charging is required.
	Two bars: The remaining battery power is sufficient, and no charging is required.
	One bar: The remaining battery power is low, and the battery is ready to be charged.
	Zero bar: The battery is too low. Charge immediately or turn off the veterinary endoscopic image processor.

3. Confirm that the LED light at the tip of the endoscope is on. (As shown in Figure 3.6)

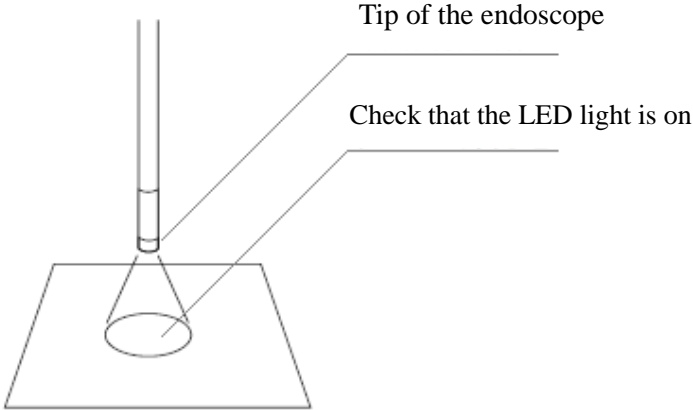


Figure 3.6

4. Point the tip of the endoscope towards a suitable object and move it between 6 cm and 10 cm. Confirm that the image color and brightness of the object on the LCD screen are basically stable. (As shown in Figure 3.7)

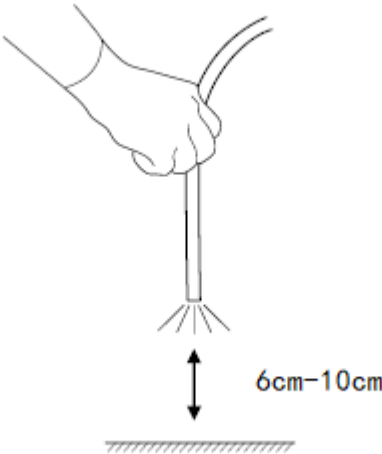




Figure 3.7

Description

- Under normal circumstances, the image color is factory-set to optimal settings, and no additional adjustment is required. If you feel the endoscopic image color is abnormal, refer to the “White Balance Adjustment” section for white balance adjustment.

5. Confirm the product function: Short press the button 2# on the handle. An icon  will appear in the upper left corner of the LCD screen, indicating that the product can take photos normally (as shown in Figure 3.8). Short press the button 3# on the handle. A flashing red icon  will appear above the LCD screen, indicating that the product can be used for video recording normally (as shown in Figure 3.9).

The appearance of the icon indicates successful photography

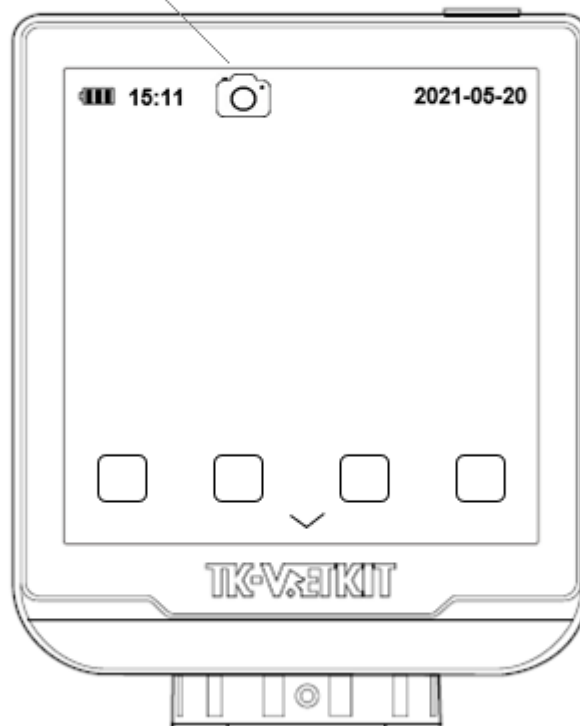


Figure 3.8

The icon is flashing while recording



Figure 3.9

6. Place the tip of the endoscope on the palm and observe the palm to make sure that the endoscopic images are free of noise, stains, blurs, or other abnormalities.

7. Slowly tilt the angle of the LCD screen, as shown in Figure 3.10. Confirm that no abnormalities, such as difficulty in moving occurred during the movement.

Warning

- If the tilt angle adjustment of the LCD screen is loose and/or not smooth, the structure may be abnormal. In this case, do not use the veterinary endoscopic image processor.

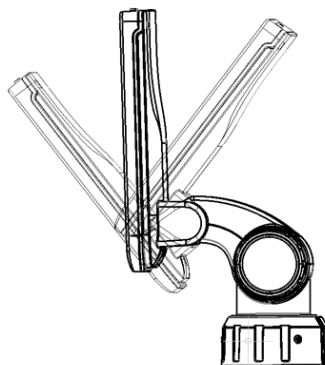


Figure 3.10

3.3.2 Connecting the veterinary endoscope and the USB video adapter cable

1. Hold the USB video adapter cable with your right hand and tighten the locking screw cap clockwise with your left hand.
2. Hold the operating handle of the veterinary endoscope with your left hand and the USB video adapter cable with your right hand, and prepare to connect the locking screw cap of the USB video adapter cable to the handle connection base of the veterinary endoscope.
3. Before connection, align the protruding part marked with "OPEN" and "LOCK" on the locking screw cap and the function button ① on the endoscope. Then, hold the locking screw cap of the video adapter cable with your right hand and press it downward into the handle connection base until it is fully inserted. Tighten the locking screw cap of the veterinary endoscopic image processor with your right hand in the direction indicated by LOCK. (As shown in Figure 3.11)

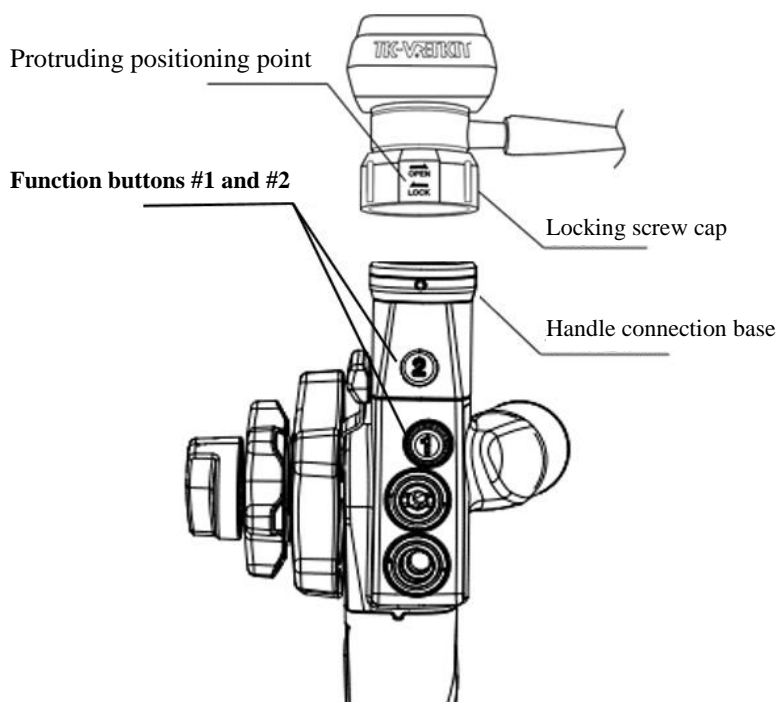


Figure 3.11

Connecting the USB video adapter to the computer

Connect the USB on the USB video adapter to the USB port of a computer that has been confirmed for compatibility.

Description

- Before connecting the veterinary endoscope to a computer, the operator shall check the functionality and reliability of the USB port of the connected computer. Poor connection or a non-genuine operating system may cause the veterinary endoscope to fail to operate properly.

Description

The information on the equipment compatible with the veterinary endoscope is described in Section 2.4.

Checking the endoscopic image/tip

Complete the connection of the veterinary endoscope, USB video adapter cable and computer as described in Section 3.2. After confirming that there are no errors, proceed with the following inspection of the endoscopic images and tip.

1. After displaying the real-time image in the computer, check whether the LED light at the tip of the veterinary endoscope is on. (As shown in Figure 3.12)

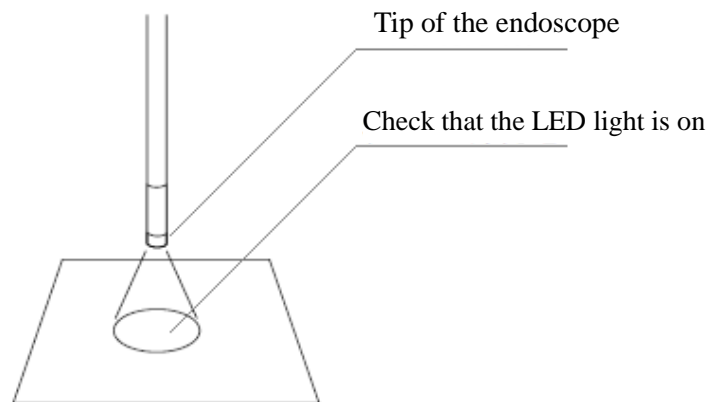


Figure 3.12

2. Point the tip of the endoscope towards a suitable object and move it between 6cm and 10cm to confirm that the image color and brightness of the suitable object on the LCD screen are basically stable. (As shown in Figure 3.13)

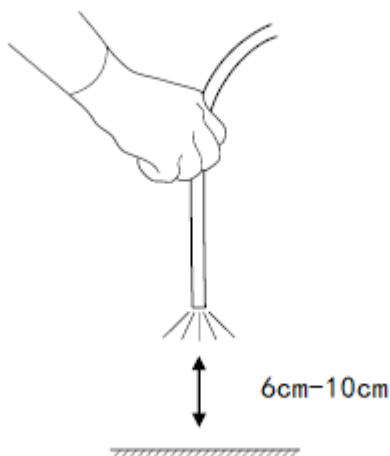


Figure 3.13

Description

- Under normal circumstances, the image color has been adjusted to the best at the factory, and no additional adjustment is required. If you feel the endoscopic image color is abnormal, refer to the “White Balance Adjustment” section for white balance adjustment.

3. Place the tip of the veterinary endoscope on the palm and observe the palm to make sure that the endoscopic images are free of noise, stains, blurs, or other abnormalities.

4. Check the functions of the control buttons on the handle of the veterinary endoscope. According to the description in Section 2.2, check whether the functions of the control buttons are abnormal.

5. Slowly adjust the angle handle of the veterinary endoscope and check whether the endoscopic images displayed by the computer photography software output real-time images in the direction adjusted by the angle handle.

3.4 Checking the Endoscope

Cleaning and disinfection or sterilization shall be performed as described from Chapter 5 “Cleaning, Disinfection and Sterilization: General” to Chapter 7 “Cleaning, Disinfection and Sterilization Procedures”.

□ Checking the endoscope

1. Check the operation section and light guide plug for excessive scratches, deformation, or other abnormalities.
2. Check for bending, twisting or other abnormalities at the protection sleeve and the insertion section.
3. Check the entire insertion section surface including the bending section and tip for recesses, bulges, expansions, scratches, holes, looseness, deformations, bends, foreign object attachments, missing components, protrusions or other abnormalities.
4. Gently stroke the entire insertion section surface in both directions with your hand (as shown in Figure 3.14). Make sure that there are no objects or metal wires in the insertion section protruding and getting stuck in the hand, and that the insertion section is not abnormally stiff.

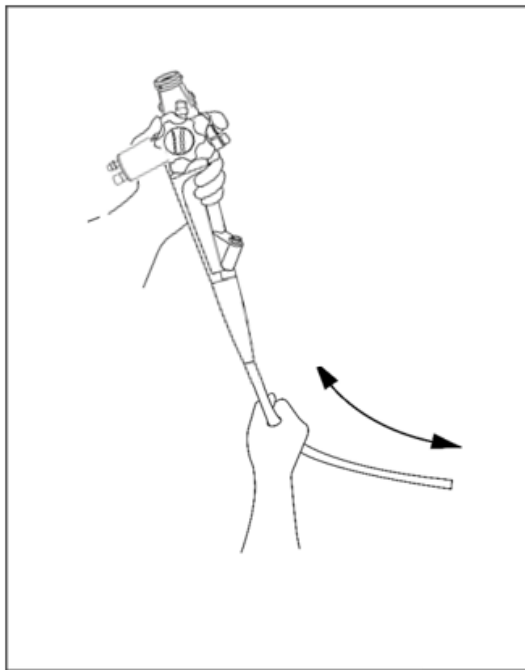


Figure 3.14

5. Bend the endoscope's insertion section into a semi-circle with both hands, and then move both hands in the direction indicated by the arrow (as shown in Figure 3.15). Confirm that the entire bending section can be smoothly bent into a semi-circle and has good flexibility.

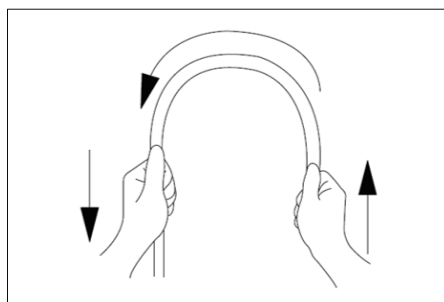


Figure 3.15

6. Gently hold the middle part of the bending section and the area 20 cm away from the tip with your hand, and gently push and pull to confirm that there is no gap between the bending section and the insertion section.
7. Check whether there are scratches, cracks, stains or other abnormalities on the objective lens and light guide bundle at the tip of the endoscope.
8. Check whether the air/water delivery nozzles at the tip of the endoscope are swollen, raised, dented or have other abnormalities.

□ Inspecting the bending function

When the bending section is in a straight state, the following checks shall be carried out.

Warning

- If the up/down angle lock, left/right angle lock and each angle control knob do not move smoothly, there may be a problem with the bending function. In this case, do not use the endoscope, otherwise the bending section may not be straightened during the examination.

□ Checking smooth operation

1. Confirm that the up/down and left/right angle locks are in the “F ▶” position, as shown in Figure 3.16(a).
2. Slowly rotate the up/down and left/right angle control knobs to the full range of motion, and then return to the natural position. Make sure that the bending operation of the bending section is smooth and normal, and that it is able to achieve maximum amplitude and return to its natural position, as shown in Figures 3.16(b) and (c).

- As shown in Figure 3.16, slowly rotate the up/down and left/right angle control knobs to their respective natural positions, and confirm that the bending section can smoothly return to a nearly straight state, as shown in Figure 3.16(d).

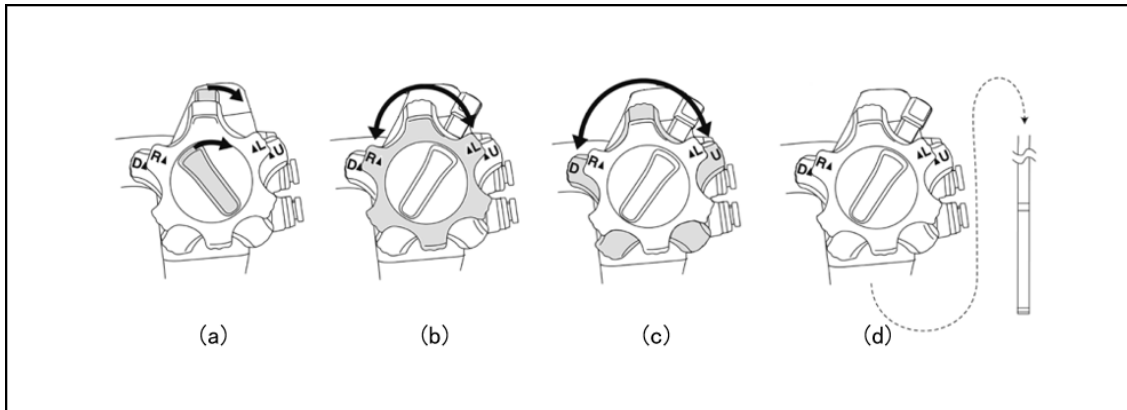


Figure 3.16

□ Checking the up/down angle adjustment function

- Rotate the up/down angle lock to the opposite direction of the marked "F ▶". Rotate the up/down angle control knob to the full range of motion in the "▲U" or "D▲" direction respectively, as shown in Figures 3.17(i), (ii), and (iii).
- Before releasing the up/down angle control knob, make sure that the angle of the bending section is locked.
- Loosen the angle control knob and rotate the up/down angle lock to the "F ▶" direction to confirm that the bending section is in a straight state, as shown in Figure 3.5(iv).

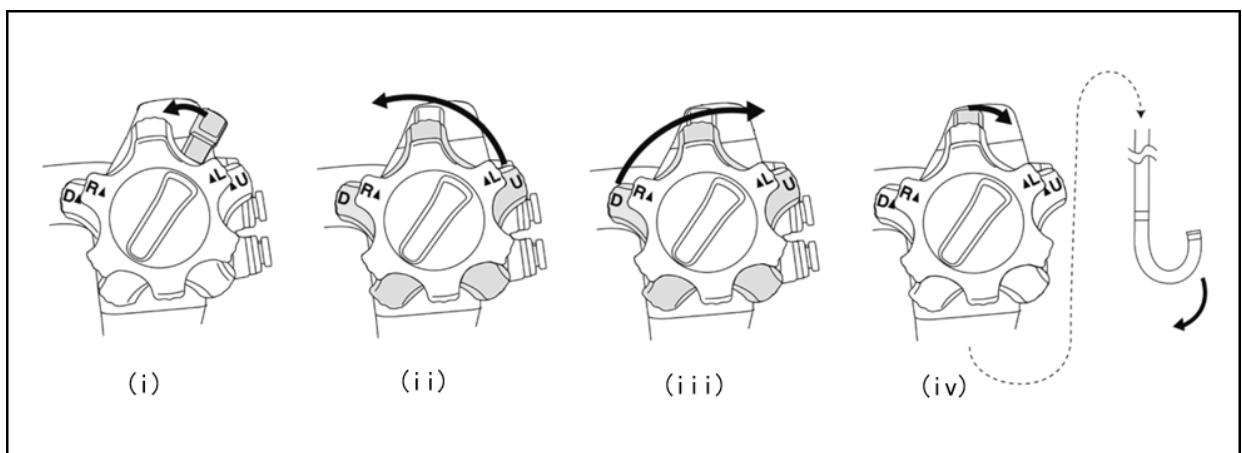


Figure 3.17

□ Checking the left/right angle adjustment function

1. Rotate the left/right angle lock to the opposite direction of the marked “F ▶”. Rotate the left/right angle control knob to the full range of motion in the “R ▲” or “▲L” direction respectively, as shown in Figures 3.18(1), (2), and (3).
2. Before releasing the left/right angle control knob, make sure that the angle of the bending section is locked.
3. Loosen the angle control knob and rotate the left/right angle lock to the “F ▶” direction to confirm that the bending section is in a straight state, as shown in Figure 3.18(4).

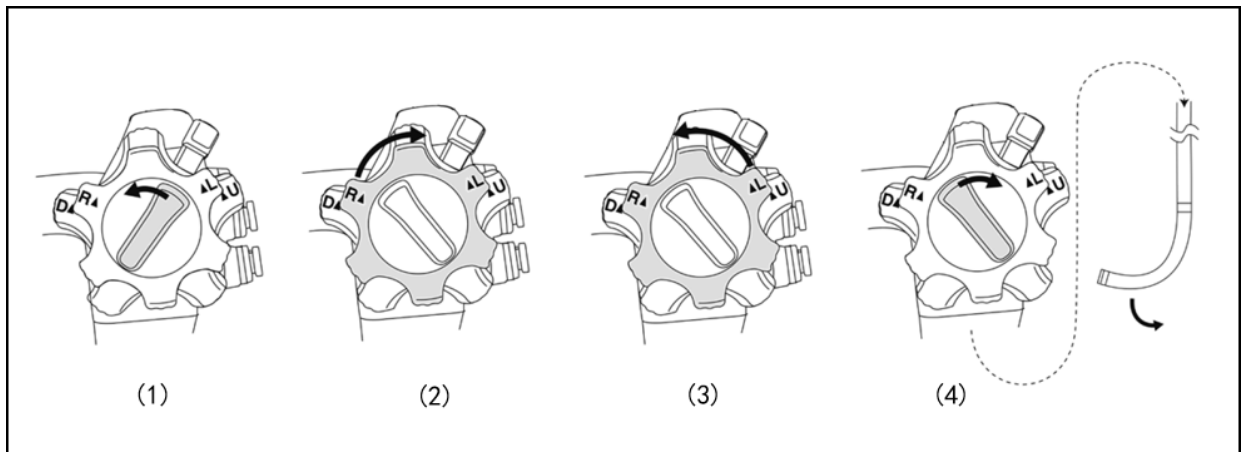


Figure 3.18

3.5 Preparation and Inspection of Accessories

Clean and disinfect or sterilize the Air/Water Delivery button, Suction button and clamp pipe opening in accordance with the contents of the “Cleaning, Disinfection and Sterilization” section.

□ Checking the Air/Water Delivery button and Suction button

Warning

- The Air/Water Delivery button and the Suction button are consumables. If any abnormality is found, please replace the button with a new one. Confirm whether the small hole on the Air/Water Delivery button is blocked (as shown in Figure 3.7). If it is blocked, it will continue to deliver air, causing pain, hemorrhage or perforation in the animal.
1. Confirm that the small hole on the button is not blocked (as shown in Figures 3.19 and 3.20).
 2. Confirm that the button is not deformed or cracked (as shown in Figures 3.19 and 3.20).
 3. Check whether the sealing gasket of the Air/Water Delivery button has excessive scratches or cracks (as shown in Figure 3.19).

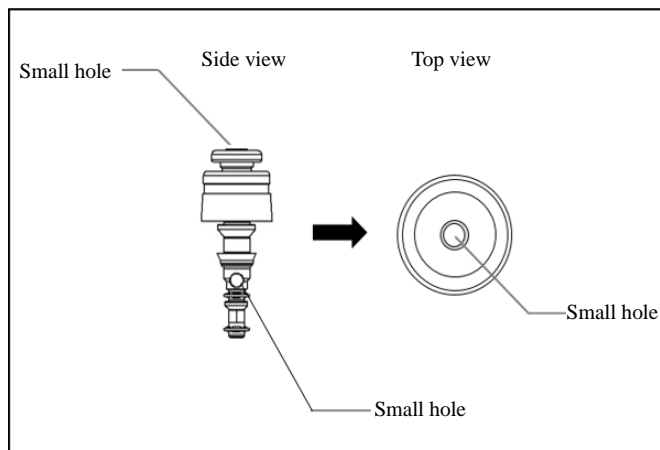


Figure 3.19

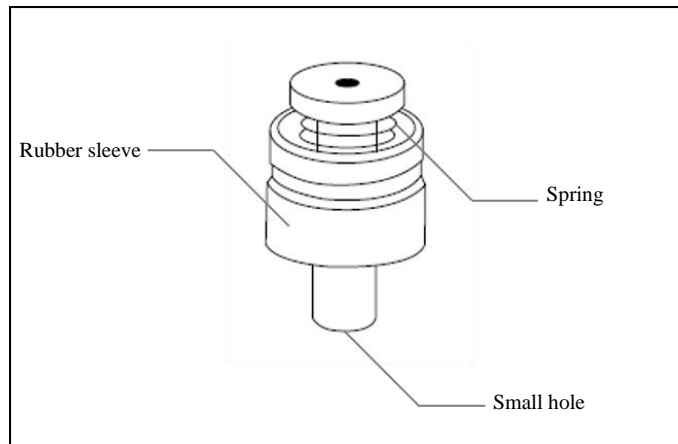


Figure 3.20

□ Checking the biopsy valve cap

Warning

- The biopsy valve cap is a vulnerable component. Before each use, it shall be inspected. When conducting the following checks, if any abnormalities are found, a new biopsy valve cap shall be replaced. Abnormal or damaged biopsy valve caps can affect the suction effect of the endoscope and also cause leakage or splashing of animal debris or liquids, posing an infection risk.

1. Confirm that there are no cracks, ruptures, deformations or other damages in the slits and holes of the biopsy valve cap (as shown in Figure 3.21).

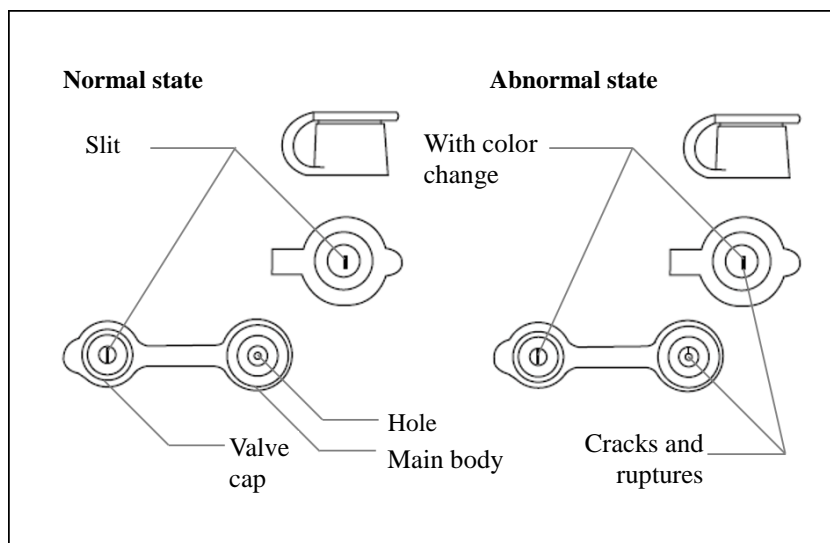


Figure 3.21

2. Cover the valve cap on the main body (as shown in Figure 3.22).

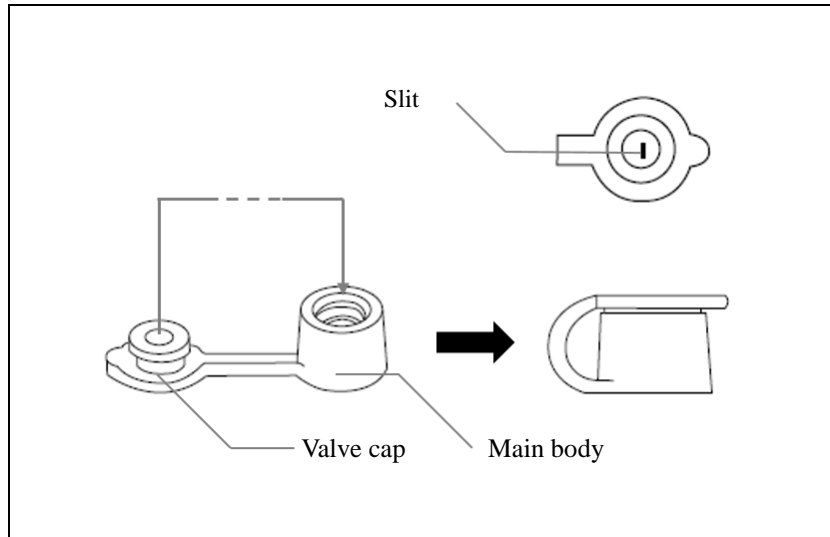


Figure 3.22

3.6 Installation of Endoscopic Accessories

Warning

- The Air/Water Delivery button and the Suction button do not require lubrication. Lubricants can swell the button sealing gasket and affect the function of the button.

□ Installing the Suction button

1. Align the two metal protrusions at the lower end of the Suction button with the two small holes on the piston.
2. Install the Suction button on the suction interface of the endoscope (as shown in Figures 3.23 and 3.24), confirm that the button is installed properly, the rubber sleeve is not raised, and make sure that the button cannot rotate.

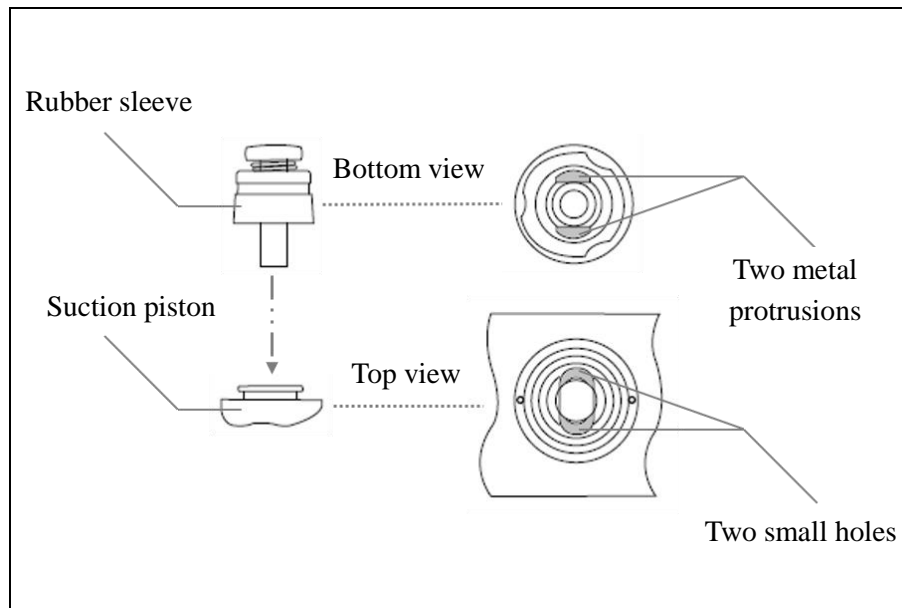


Figure 3.23

Description

- When the Suction button is dry, it may emit a whistling sound, which does not indicate a malfunction.

□ Installing the Air/Water Delivery button

1. Install the Air/Water Delivery button on the air/water delivery interface of the endoscope (as shown in Figure 3.24).
2. Confirm that the button is installed properly and the rubber sleeve is in place.

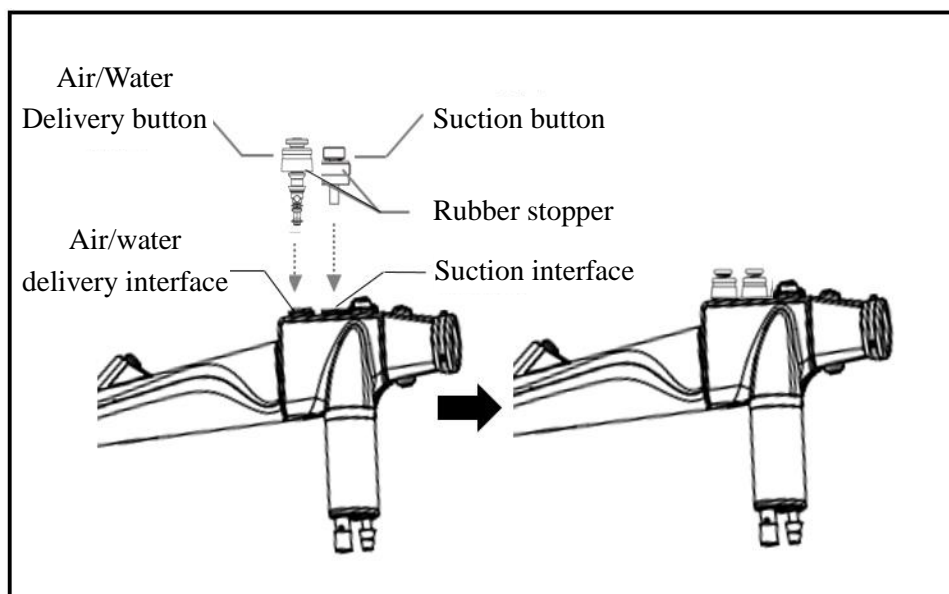


Figure 3.24

Description

- The Air/Water Delivery button may feel slightly stiff at the beginning, but it will be smooth after a few operations.

□ Installing the biopsy valve cap

Warning

- If the biopsy valve cap is not properly connected to the clamp pipe opening, it will affect the suction effect of the endoscope and may also cause leakage or splashing of animal debris or liquids, posing an infection risk.

Install the biopsy valve cap on the clamp pipe opening of the endoscope (as shown in Figure 3.25). Confirm that the valve cap is installed properly.

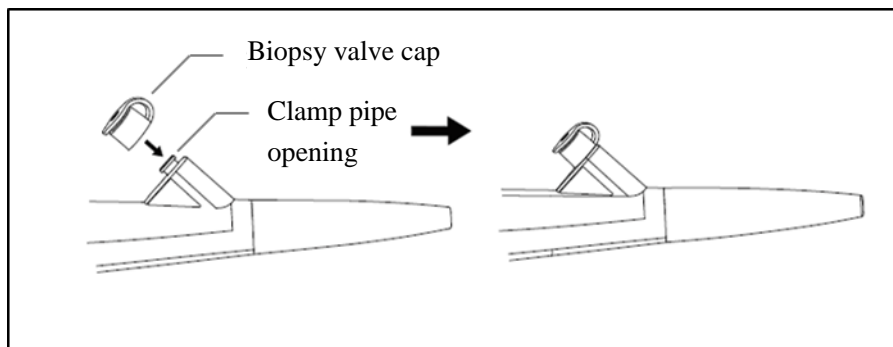


Figure 3.25

3.6 Checking and Connecting the Peripheral Equipment

Description

- Install the water bottle in the portable air pump.
- When removing the water bottle connector from the endoscope, do not let water splash out from the water bottle connector. If water splashes onto the equipment, it will affect the performance of the equipment.
- Prepare and inspect the portable air pump, image processing device, video monitor, suction pump, and endoscopic diagnostic and therapeutic accessories in accordance with their respective user manuals.

□ Connecting the endoscope and peripheral equipment

Warning

- Firmly connect the suction tube of the suction pump to the suction joint of the endoscope. If the connection is improper, debris may leak out of the tube, posing an infection risk, causing equipment damage or reducing the suction performance of the equipment.

1. Power off all peripheral equipment.
2. Connect the water bottle connector to the air/water delivery connector, as shown in Figure 3.26.
3. Make sure that the water bottle connector is connected properly. The water bottle connector shall have no obvious torque or stress at the air/water delivery interface.

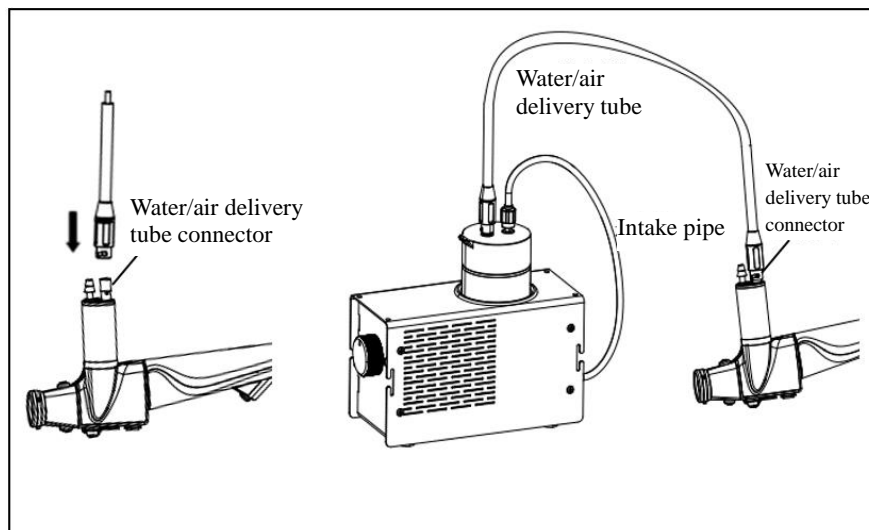


Figure 3.26

4. Connect the suction tube of the suction pump to the suction joint of the light guide plug (as shown in Figure 3.27).

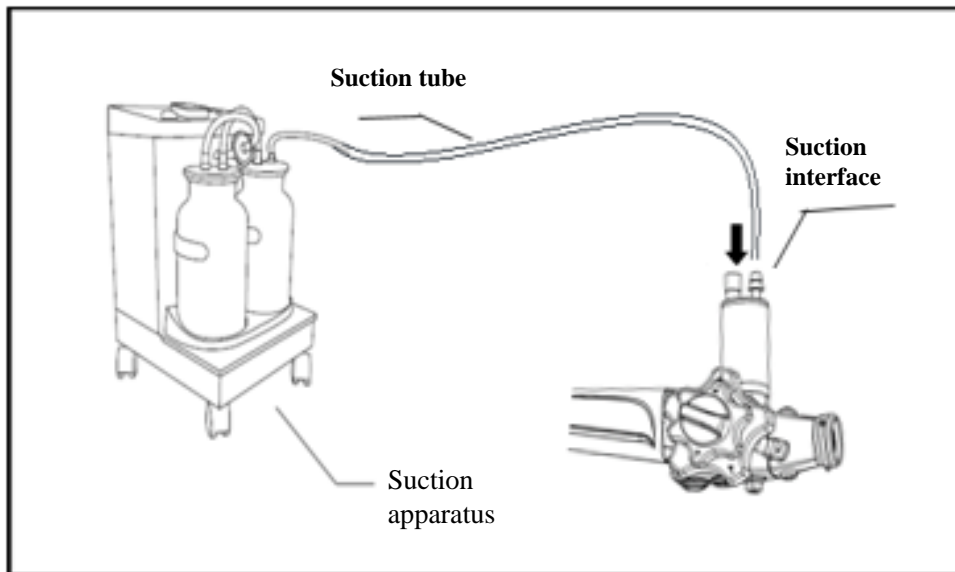


Figure 3.27

3.7 Checking the Endoscopic System

□ Checking the endoscopic image

Warning

- Do not look directly at the tip of the endoscope when outputting illumination light, as this may cause eye injury.
1. According to the respective user manuals of the supporting equipment, turn on the image processing equipment and video monitor, and check the endoscopic image.
 2. Confirm that the tip of the endoscope outputs illumination light.
 3. Observe your palm and confirm that there is no interference, foggy blur, or other abnormalities in the endoscopic image.
 4. Bend the endoscope to confirm that the endoscopic image has not temporarily disappeared or is otherwise abnormal.

Description

- If the visual field of the endoscope is blurred, the objective lens shall be wiped with a clean lint-free cloth dipped in 75%-95% ethanol or propanol.

□ Checking the Handle buttons

Warning

- Even if you are not going to use the Handle buttons, you should check that all Handle buttons are working properly. Otherwise, the endoscopic image may freeze or otherwise become abnormal during the examination, causing injury, hemorrhage or perforation of the animals.

Press each button on the handle to confirm that the set function is working properly.

□ Checking the air delivery function

1. According to the user manual of the portable air pump, adjust the portable air pump to the highest level.
2. Immerse the tip in sterile water to a depth of 10 cm or less, and confirm that no bubbles emerge when the Air/Water Delivery button is not operated.
3. Plug the small hole on the Air/Water Delivery button with your hand to confirm that bubbles are continuously emerging from the air/water delivery nozzle.
4. Loosen the small hole on the Air/Water Delivery button to confirm that no more bubbles are emerging from the air/water delivery nozzle.

Warning

- If the Air/Water Delivery button is not operated and bubbles continue to emerge from the air/water delivery nozzle when the tip is immersed in sterile water to a depth of 10cm or less, it may be an abnormal air delivery function. If air is continuously delivered, it will lead to excessive air delivery and injury to the animals.
- If bubbles emerge from the air/water delivery nozzle, remove the Air/Water Delivery button, and then reinstall it properly or replace it with a new one. If the bubbles still cannot be eliminated, do not use the endoscope as it may be faulty. Please contact us.

Description

- If the tip is immersed in sterile water to a depth of less than 10 cm and a small amount of bubbles emerge from the air/water delivery nozzle when the Air/Water Delivery button is not operated, this does not indicate a malfunction.

□ Checking the objective lens cleaning function

Warning

- Sterile water must be used. The use of non-sterile water may lead to cross-infection or transmission among animals.

Description

- When the Air/Water Delivery button is pressed for the first time, it may take a few seconds for water to flow out.
 - If the Air/Water Delivery button returns to its original position slowly after water delivery, please remove the button and moisten the sealing gasket surface of the Air/Water Delivery button with sterile water.
 - During the examination, place the tip of the endoscope in a beaker or another container to avoid wetting the surface.
1. Place your finger on the Air/Water Delivery button and press the button. Confirm that there is water flow throughout the entire objective lens by observing the endoscopic image.
 2. Release the Air/Water Delivery button and confirm the water delivery stop by observing the endoscopic image. The Air/Water Delivery button can smoothly return to its original position.
 3. While observing the endoscopic image, block the small hole on the Air/Water Delivery button with your finger and start the air delivery. Confirm that the air delivery can dry the objective lens and obtain a clear endoscopic image.

□ Checking the suction function

Warning

- If the Suction button does not operate smoothly, please remove it and reinstall it, or replace it with a new one. When the Suction button is abnormal, using the endoscope may prevent the suction from stopping, resulting in injury to the animals. If reinstallation or replacement of new parts still fails to operate smoothly, the endoscope may have malfunctioned. Please stop using it and contact us.
 - If the biopsy valve cap has air leakage, please replace it with a new one. Using a biopsy valve cap leaking air can reduce the suction function of the endoscope and also cause leakage or splashing of animal debris or liquids, posing an infection risk.
1. Place the water bottle filled with sterile water and the endoscope on the same table. When checking the suction, adjust the suction pressure.
 2. Immerse the tip in sterile water so that the height of the clamp pipe opening is close to the water level of the sterile water in the water bottle. Press the Suction button and confirm that the water is continuously drawn out from the tip of the endoscope.
 3. Release the button, confirm that the suction stops and the button returns to its original

position.

4. Press the Suction button to suck water for one second. Then release the Suction button for one second. Repeat several times to make sure that no water leaks from the biopsy valve cap.
5. Remove the tip of the endoscope from the water. Press and hold the Suction button, suck air for a few seconds, and remove the water in the clamp pipe.

□ Checking the clamp pipe

Warning

- When inserting the endoscopic diagnostic and therapeutic accessories, keep the tip away from the eye. Otherwise, the endoscopic diagnostic and therapeutic accessories extending from the tip may cause eye injury.
1. Insert the endoscopic diagnostic and therapeutic accessories through the clamp pipe opening. Confirm that the endoscopic diagnostic and therapeutic accessories extend smoothly from the tip and no foreign objects fall out of it.
 2. Confirm that the endoscopic diagnostic and therapeutic accessories can be smoothly withdrawn from the clamp pipe.

Chapter 4 Functions and Operations

The operator of this endoscope must be a veterinarian or a medical staff under the supervision of a veterinarian. They must be adequately trained in the clinical endoscopic techniques. Therefore, this User Manual does not explain or discuss any clinical endoscopic techniques, but only describes the basic operations and measures related to the operation of this endoscope.

Warning

- Wearing personal protective equipment can protect the operator from hazardous chemical agents and potentially infectious substances. Suitable personal protective equipment (e.g., goggles, face shield, waterproof clothing and chemical protective gloves) shall be worn during operation. Protective equipment shall be of appropriate size and long enough to avoid skin exposure.
- Due to the high illumination, the temperature at the tip of the endoscope may exceed 41°C and even reach 50°C. Surface temperatures above 41°C may cause mucosal burns. Try to use the lowest brightness, shortest time and proper distance that can meet the needs of accurate observation. Whenever possible, avoid close static observation and do not place the tip of the endoscope close to the mucous membrane for too long.
- Try to turn off the endoscope illumination before and after the examination. Continuous illumination can increase the temperature at the tip of the endoscope and cause burns to the animal or operator.
- Do not insert or withdraw the endoscope under the following circumstances. Failure to do so may result in injury, hemorrhage or perforation of the animals.
 - When the accessory protrudes from the tip of the endoscope.
 - When the bending section is locked.
 - When inserting/withdrawing the endoscope with excessive force or forcibly.
- If any of the following circumstances occurs during use, stop using the endoscope immediately, and withdraw it slowly as described in Section 10.2 “Withdrawing an Abnormal Endoscope”.
 - - If you suspect that the endoscope is functioning abnormally.

- - If the endoscopic image on the video monitor disappears or freezes unexpectedly.
 - - If the angle control knob is locked.
 - - If the angle control function is abnormal.
 - - If the magnification function is abnormal (when using the image magnification function of the image processing equipment).
- Continued use of the endoscope in such cases may result in injury, hemorrhage or perforation of the animals.
 - If the image or function of the endoscope is abnormal, but it can return to normal quickly, the endoscope may be faulty. Continued use of the endoscope may result in another abnormality instead of returning to normal. In this case, the inspection shall be stopped immediately and the endoscope shall be slowly withdrawn while observing the endoscopic image. Failure to do so may result in injury, hemorrhage or perforation of the animals.

4.1 Insertion

□ Grip and operation of the endoscope

Hold the operation section of the endoscope with the left hand. The index finger of the left hand operates the Air/Water Delivery button and Suction button, and the thumb of the left hand can freely operate the up/down angle control knob. Operate the insertion tube and the left/right angle control knob with your right hand (as shown in Figure 4.1).

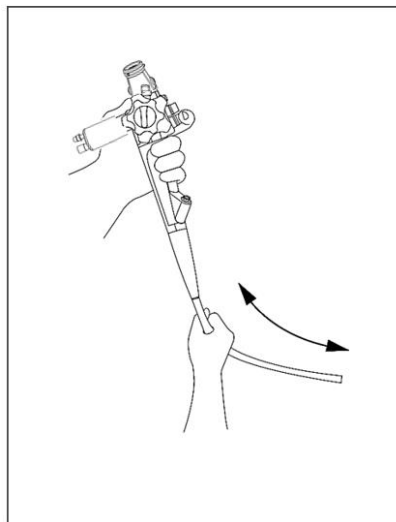


Figure 4.1

□ Inserting the endoscope

Description

- To prevent the animal from accidentally biting the insertion section during the examination, if necessary, it is recommended to place a guide tongue piece or a dental pad in the animal's mouth before inserting the endoscope.
- Do not apply olive oil or products containing vaseline as a lubricating component (such as vaseline), as these products will age the surface of the bending section and thus lead to elasticity loss.
- As shown in Figure 4.2, do not bend the part within 10 cm from the contact point between the protective sleeve and the operation section. Otherwise, it may cause damage to the insertion section.

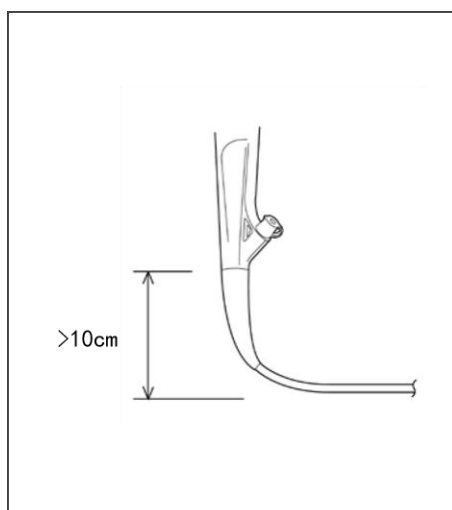


Figure 4.2

1. If necessary, apply medical water-soluble lubricant to the insertion section.
2. Insert the tip of the endoscope through the opening of the mouth guard, and then insert the tip of the endoscope into the throat while observing the endoscopic image. Do not exceed the insertion section limit when inserting.

□ Bending angle of the tip

Warning

- Do not force the bending mechanism or apply excessive force during angulation. Otherwise, the metal wire controlling the bending section will bear a relatively large load. This may cause the metal wire to stretch or break, affecting the activity of the bending section.
1. Operate the angle control knob as needed to guide the insertion and observation of the tip.

2. The angle lock of the endoscope is used to fix the tip position with an angle.

Description

- When the angle lock is locked and the endoscopic diagnostic and therapeutic accessories are inserted, the angle of the tip may change. When it is necessary to maintain the angle, fix the angle control knob with your hand.
- When operating the up/down or left/right angle lock, fix the angle control knob with your finger. Otherwise, the angle will change.

□ Air/water delivery

Warning

- If there is too little sterile water in the water bottle, air will be delivered instead of water. In this case, turn off the portable air pump switch and add sterile water to the water bottle to the specified water level.
 - If the air/water delivery cannot be stopped, the air pump switch on the portable air pump shall be turned off and a new button replaced.
 - When injecting liquid from the clamp pipe opening using a syringe, the valve cap shall be removed from the main body. Insert the syringe vertically into the clamp pipe opening and inject the liquid. If the valve cap is not removed or the syringe is not inserted vertically, it will damage the clamp pipe opening, reduce the suction effect of the endoscope, and also cause animal debris or liquids to leak or splash out from the clamp pipe opening, posing an infection risk.
 - If during the operation, the clamp pipe opening is opened and animal debris or liquids leak or splash out from the clamp pipe opening, posing an infection risk. When opening the clamp pipe opening, cover it with a sterile gauze to prevent leakage.
 - If the temperature of the endoscope is too low, condensation may form on the surface of the objective lens, and the endoscopic image may be somewhat blurry. In this case, the temperature of the sterile water in the water bottle should be raised to 40-50°C before using the endoscope.
1. Block the small hole on the Air/Water Delivery button and deliver air through the air/water delivery nozzle of the tip (as shown in Figure 4.3).
 2. Press the Air/Water Delivery button to deliver water to the objective lens (as shown in Figure 4.3).

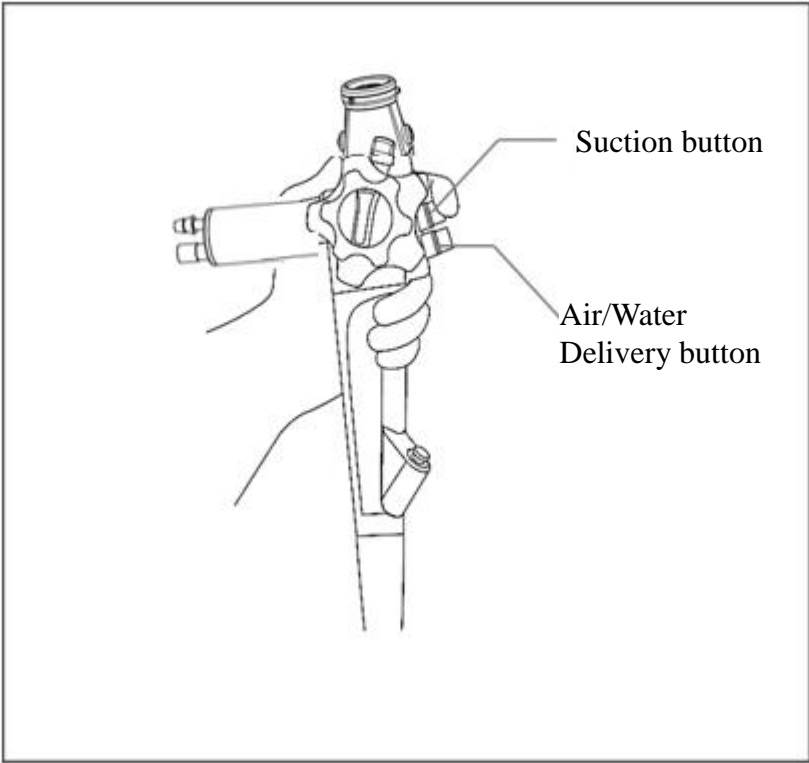


Figure 4.3

Warning

- Do not suck solid substances or high-viscosity liquids. Otherwise, it will cause the suction tube or Suction button to be blocked. If the Suction button is blocked, the suction cannot be stopped. Please remove the suction tube from the suction joint on the light guide plug. Turn off the suction pump, remove the Suction button, and remove solid substances or high-viscosity liquids.
- When solid substances such as clamps or high-viscosity liquids are sucked, if the Suction button is blocked and the suction function cannot be used, withdraw the endoscope and remove the suction tube from the suction joint of the light guide plug. Install a syringe filled with sterile water at the suction joint. Straighten the insertion tube as straight as possible and rinse the joint forcefully with water. At this point, the Suction button of the endoscope will slightly sink. Repeat the rinsing until the high-viscosity liquid or solid substance flows out from the tip of the suction tube. Before using the endoscope again, confirm that there are no abnormalities in the suction function according to the content of “Checking the suction function”. If high-viscosity liquids or solid substances cannot flow out, stop using the suction function and contact us.
- When performing suction, please set the suction pressure to the minimum value required for safe operation. Excessive suction pressure can cause the mucous membrane to be adhered and damaged. It may also cause animal debris or liquids to leak or splash out from the clamp pipe opening, posing an infection risk.
- When performing suction, cover the biopsy valve cap on the clamp pipe opening body. Otherwise, it will affect the suction effect and also cause leakage or splashing of animal debris or liquids, posing an infection risk.
- During the examination, please note that the liquid in the suction bottle should not be too full. Sucking liquid into a full bottle will damage the suction pump.

Caution

Press the Suction button to suck excess liquid or other debris that may obstruct the endoscope’s field of view (as shown in Figure 4.3).

Description

- Simultaneous air delivery and suction make it easier to remove water droplets from the surface of the objective lens.

4.2 Use of Endoscopic Diagnostic and Therapeutic Accessories

For details on the use of this endoscope in conjunction with various diagnostic and therapeutic accessories, please refer to the user manual of each diagnostic and therapeutic accessory.

Warning

- When using the accessory, the distance between the tip of the endoscope and the mucous membrane shall be greater than the minimum visible distance of the endoscope to facilitate the observation of the accessory in the endoscopic image. If the endoscope is placed within the minimum visible distance, the endoscopic image will not show the position of the accessory. It may lead to serious injuries to the animals or damage to equipment. The minimum visible distance depends on the type of endoscope.
- When inserting or withdrawing the accessory, make sure that its tip is closed or retracted into the sheath tube. Slowly and vertically insert or withdraw the accessory out of the slit of the clamp pipe opening. Otherwise, the clamp pipe opening will be damaged and its fragments will fall off.
- If it is difficult to insert or withdraw the accessory, please straighten the bending section as much as possible without affecting the endoscopic image. Excessive force in inserting or withdrawing the accessory can cause damage to the clamp pipe or the accessory fragments to fall off, resulting in injury to the animals.
- When the tip of the accessory cannot be observed in the endoscopic image, do not open the tip of the accessory or extend the needle section. Otherwise, it may cause injury, hemorrhage or perforation of the animals or damage to the equipment.

Caution

- When using a biopsy forceps with a needle, confirm that the needle is not excessively bent. An overly bent needle will protrude from the closed forceps cup. Using such biopsy forceps can damage the clamp pipe or cause injury to the animals.
- Try to insert the biopsy forceps and other accessories while keeping the bending section straight. When the bending section is bent at a large angle and the accessory is inserted, it shall be confirmed that its tip is closed or retracted into the sheath tube and within the field of view of the endoscope before opening. Otherwise, it may damage the working channel of the endoscope or cause injury to the animals.

- When using the injection needle, do not extend or retract the needle outside the injection needle sheath tube before it extends from the tip of the endoscope. Extending, inserting or withdrawing the injection needle inside the tube will damage the clamp pipe.

□ Inserting the accessory into the endoscope

Warning

- Do not forcibly or suddenly insert the accessory. Otherwise, the accessory may suddenly protrude from the tip of the endoscope, causing injury, hemorrhage or perforation of the animals.
 - When using the endoscopic diagnostic and therapeutic accessories, removing the biopsy valve cap makes it easier to insert the accessories. However, opening or removing the biopsy valve cap will reduce the suction effect of the endoscope and also cause leakage or splashing of animal debris or liquids, posing an infection risk. Therefore, when the endoscopic diagnostic and therapeutic accessories are not used, the biopsy valve cap shall be placed on the main body.
 - Opening the biopsy valve cap may cause leakage or splashing of animal debris or liquids, posing an infection risk. When the clamp pipe opening is opened, cover the opening with a sterile gauze to prevent leakage.
 - Do not let the endoscopic diagnostic and therapeutic accessories droop at the clamp pipe opening, as this will increase the gap between the accessories and the slit or hole of the clamp pipe opening, thereby damaging the clamp pipe opening. This will reduce the suction effect of the endoscope and also cause leakage or splashing of animal debris or liquids, posing an infection risk.
 - Hold the part of the accessory close to the clamp pipe opening and insert it slowly and gradually vertically. Otherwise, the endoscopic diagnostic and therapeutic accessories or clamp pipe opening will be damaged. This will reduce the suction effect of the endoscope and also cause leakage or splashing of animal debris or liquids, posing an infection risk.
1. For details on the operation of endoscopic diagnostic and therapeutic accessories, please refer to the user manual of endoscopic diagnostic and therapeutic accessories.
 2. Keep the up/down and left/right angle control knobs stationary.

3. Confirm that the tip of the accessory is closed and retracted into the sheath tube, and then slowly insert the accessory straight into the slit of the clamp pipe opening.

Caution

- Do not open the accessory in the clamp pipe opening or extend the tip of the accessory out of the sheath tube. Otherwise, the clamp pipe or diagnostic and therapeutic accessories will be damaged.
 - Hold the part of the accessory close to the clamp pipe opening and insert it slowly and gradually vertically. Otherwise, the sheath tubes of the endoscopic diagnostic and therapeutic accessories will be bent or damaged.
4. Hold the accessory 4cm away from the clamp pipe opening. While observing the endoscopic image, insert it slowly and vertically.

Description

- When the tip of the endoscopic diagnostic and therapeutic accessories extends more than 3mm from the tip of the endoscope, the accessory will be seen in the endoscopic image.

□ Operating the endoscopic diagnostic and therapeutic accessories

Operate the endoscopic diagnostic and therapeutic accessories in accordance with their respective user manuals.

□ Withdrawing the endoscopic diagnostic and therapeutic accessories

Warning

- When withdrawing the accessory from the clamp pipe opening, animal debris may splash out. Cover the accessory and the clamp pipe opening with gauze to prevent debris from splashing out.
- Do not withdraw the accessory if the tip of the accessory is open or protruding from the sheath tube. Otherwise, it may cause injury, hemorrhage or perforation of the animals or damage to the equipment.
- When withdrawing the accessory from the clamp pipe opening, be sure to operate slowly and keep it straight. Otherwise, the slit or small hole of the clamp pipe opening will be damaged. This will reduce the suction effect of the endoscope and also cause leakage or splashing of animal debris or liquids, posing an infection risk.
- If the accessory cannot be withdrawn from the endoscope, close the accessory or retract it into the sheath tube. While observing the endoscopic image, carefully remove the endoscope and the

accessory simultaneously, and be careful not to cause tissue damage.

Close the tip of the accessory or retract it into the sheath tube, and slowly withdraw the endoscopic diagnostic and therapeutic accessories.

4.3 Withdrawing the Endoscope

Warning

- If blood is found on the surface of the withdrawn endoscope's insertion section, the condition of the animal shall be carefully examined.
1. When using the image magnification function of the image processor, disable this function.
 2. Press the Suction button to suck excess air, blood, mucus or other debris.
 3. Rotate the up/down and left/right angle locks in the "F ▶" direction to release the lock.
 4. While observing the endoscopic image, slowly withdraw the endoscope.

Chapter 5 Cleaning, Disinfection and Sterilization: General

5.1 Essentials for Cleaning, Disinfection and Sterilization

Medical literature has recorded incident reports of cross infection caused by improper cleaning, disinfection or sterilization. It is strongly recommended that all personnel engaged in cleaning, disinfection, or sterilization must carefully follow the instructions in this Manual and the instructions for use of all auxiliary equipment, and fully understand the following:

- Occupational health and safety regulations at your hospital.
- Cleaning, disinfection and sterilization procedures for individual equipment.
- Structure and operation of the endoscopic equipment.
- Use of relevant chemical agents.

Make a professional judgment on the type and conditions of the cleaning, disinfection and sterilization methods used.

Please refer to cleaning, disinfection and sterilization standards for the country where the product is used. Contact your local health agency for local standards and regulations.

5.2 Precautions

Warning

- After each examination, if the endoscopic equipment is not effectively cleaned, disinfected and sterilized, it will endanger the animal's safety. To reduce the risk of cross infection, after each case of examination, the endoscope must be thoroughly cleaned and then disinfected or sterilized as described in Chapter 7 "Cleaning, Disinfection and Sterilization Procedures". The outer surface and all tubes of the endoscope shall be cleaned, disinfected and sterilized.
- All tubes of the endoscope must be cleaned, disinfected or sterilized during each cleaning, disinfection and sterilization process, even if some tubes were not used in the previous animal. Otherwise, improper cleaning, disinfection and sterilization of the endoscope may pose a risk of infection to the animals or operators using the endoscope next time.
- If the endoscope is not thoroughly cleaned, it will not be effectively disinfected or sterilized. Before disinfection or sterilization, the

Caution

endoscope and accessories shall be thoroughly cleaned to remove microorganisms or organic substances that affect the disinfection or sterilization effect.

- Before using the endoscope cleaning machine, it shall be confirmed that it can clean, disinfect and sterilize endoscopes and all their tubes. If you are not sure whether the endoscope cleaning machine can clean and disinfect endoscopes and all their tubes, please contact the endoscope cleaning machine manufacturer to confirm the specific usage instructions or connection information. Improper cleaning, disinfection or sterilization of the endoscope may pose a risk of infection to the animals that use the endoscope next time.
- This User Manual specifies the chemical agents suitable for cleaning, disinfection and sterilization, and can be used in combination with the endoscope, as well as some chemical agents and endoscope cleaning and disinfection machines that cannot be used with the endoscope. For chemical agents and endoscope cleaning and disinfection machines not shown in this Manual, contact us or our designated service center and our sales representatives. Improper use of chemical agents or endoscope cleaning and disinfection machines may cause damage to the endoscopic equipment. When using these chemical agents and endoscope cleaning and disinfection machines, follow their own user manuals. The Company cannot guarantee the cleaning, disinfection and sterilization effects of these chemical agents and endoscope cleaning and disinfection machines. Please contact the manufacturers of its chemical agents and endoscope cleaning and disinfection machines for confirmation.
- Animal debris or chemical agents used for cleaning, disinfection and sterilization are hazardous. Personal protective equipment shall be worn to protect against hazardous chemical agents and potentially infectious substances. When cleaning, disinfecting or sterilizing, wear appropriate personal protective equipment such as goggles, mask, waterproof clothing and protective gloves.
- Be sure to rinse the chemical agents thoroughly. Thoroughly rinse the outer surface and all tubes of the endoscope, and cleaning and disinfection equipment with deionized water (Aq.Dest.) to remove any residual chemical agents.
- Attention must be paid to ventilation in the cleaning and disinfection rooms. Adequate ventilation helps prevent the accumulation of

vapors from harmful chemical agents.

- Before performing manual cleaning, make sure that the endoscope has been conducted with a leak test. If a leak is tested, do not use the endoscope. Using a leaked intubation endoscope may cause the image of the intubation endoscope to disappear suddenly, damage to the bending function, or other functional abnormalities.
- Before each use, it shall be confirmed that the equipment has been properly cleaned, disinfected or sterilized. If it is found that the equipment has not been properly cleaned, disinfected and sterilized, it shall be cleaned, disinfected and sterilized again according to the instructions in this Manual.
- This equipment is not durable or does not have the durability that violates the regulations of destruction or protection points in each country. Please contact us for durability information for each method. The Company does not guarantee the efficacy, safety and durability of the product if the cleaning, disinfection and sterilization methods not mentioned in this Manual are used. Before use, make sure that the equipment is free of abnormalities and use it under the guidance of a responsible physician. Never use malfunctioning equipment.

Chapter 6 Applicable Cleaning, Disinfection and Sterilization Methods and Chemical Agents

6.1 Overview on Compatibility

Our endoscopes are suitable for a variety of cleaning, disinfection and sterilization methods. However, certain components and accessories are not suitable for certain methods, otherwise it may cause damage to the appliance.

□ **Compatibility overview**

The materials and structure used by our endoscopes may not be suitable for certain cleaning, disinfection and sterilization methods. We identify whether they are effective methods based on the following two points:

- Microbial efficacy.
- Material durability.
- Microbial efficacy

If this method is declared “certified” for microbial efficacy, the standard method described in this User Manual can successfully clean, disinfect and sterilize this instrument.

- Material durability

If this method is declared “validated” for material durability, it means that this method can be used for repeated cleaning, disinfection and sterilization. Simply because the material durability is certified does not mean that the microbial efficacy is proven.

□ **Selection of cleaning, disinfection and sterilization methods**

The institution where the product is used uses the actual cleaning, disinfection and sterilization methods selected in accordance with national and local rules or regulations, and the above methods are determined by the disinfection control committee of the animal medical institution

where it is used.

The manual or automatic cleaning method that can achieve the appropriate effect shall be adopted. While manual cleaning methods may cause a risk of infection to cleaning personnel, automatic cleaning methods reduce these risks and have the advantage of standardized and certified procedures. Therefore, under normal circumstances, we recommend the automatic cleaning method for endoscope cleaning.

□ Monitoring

Inspect and certify cleaning, disinfection and sterilization methods for reusable instruments in accordance with national and local rules or regulations, and document the results of cleaning, disinfection and sterilization at regular intervals or procedures.

□ List of compatible methods and chemical agents

When selecting the appropriate cleaning, disinfection and sterilization methods, please refer to Table 6.1, the recommendations of the relevant infection control authorities and all national and local hospital regulations.

	Detergent	75%-95% ethanol or isopropanol	O-phthalaldehyde disinfectant solution	Peracetic acid disinfectant solution
Endoscope	o	o	o	o
Waterproof cover	o	o	o	o
Air/Water Delivery button	o	o	o	o
Suction button	o	o	o	o
Biopsy valve cap	o	o	o	o
Tube cleaning brush, cleaning brush	o	o	o	o
Tube plug	o	o	o	o
Suction cleaning joint	o	o	o	o

Perfusion tube	o	o	o	o
Syringe	o	o	o	o

Note: o Applicable — Not applicable

Table 6.1 (Validation of applicability)

1. This equipment can be cleaned manually and in the endoscope cleaning machine.
2. The waterproof cover can only be cleaned with a cleaning and disinfection machine when it is connected to an endoscope.

Warning

- Alcohol is not a sterilant or a high-level disinfectant.

6.2 Detergent Solution

Use a medical, low-foaming detergent (pH-neutral detergent or enzyme-containing detergent), and control its concentration and temperature according to the manufacturer's recommendations. Do not reuse the detergent.

Warning

- Excessive foam will prevent detergent from fully reaching the inside of the tube.

6.3 Disinfectant Solution

Under normal circumstances, we use the o-phthalaldehyde solution as per the manufacturer's instructions to achieve a high level of disinfection.

If the disinfectant solution is reused, the test strips recommended by the manufacturer shall be used periodically to test its efficacy. Do not use disinfectant solutions that exceed the expiration date.

6.4 Sterilant

Under normal circumstances, we use peracetic acid solution with a content of 2.0g/L as per the manufacturer's instructions to achieve sterilization.

If the sterilant is reused, the test strips recommended by the manufacturer shall be used periodically to test its efficacy. Do not use sterilant that exceed the expiration date.

6.5 Rinse Water

Once taken out of the disinfectant solution, the appliances shall be thoroughly rinsed with sterile water to remove any remaining disinfectant solution. If sterile water is not available, clean drinking water or water that has been treated (such as filtered) to remove microorganisms can also be used.

If non-sterile water is used for rinsing after disinfection, please wipe the endoscope with 75%-95% ethanol or isopropanol and rinse the tubes, then let all internal tubes air dry to prevent bacterial growth. Do not reuse the rinse water.

Chapter 7 Cleaning, Disinfection and Sterilization Procedures

Warning

- All tubes of the endoscope must be cleaned, disinfected or sterilized during each cleaning, disinfection and sterilization process, even if some tubes were not used in the previous animal. Otherwise, improper cleaning and disinfection or sterilization of the endoscope may pose a risk of infection to the animals or operators using the endoscope next time.

Caution

- Do not make the coiled diameter of the insertion section of the endoscope less than 30 cm, otherwise it may cause damage to the equipment.
- In order to fully perform cleaning, disinfection and sterilization, do not make the coiled diameter of the insertion section less than 30cm. Otherwise, it will be difficult to insert the tube cleaning brush. As a result, the suction channel of the tube and the biopsy tube are damaged, or the cleaning is not thorough.
- The air pressure or water pressure shall not exceed 0.2MPa during ventilation or lavage of the endoscopic tube. Excessive pressure may damage the endoscope.
- Before immersing the endoscope in detergent or disinfectant solution, confirm that the leak detection cover is installed on the endoscope. Otherwise, water will seep inside the endoscope and cause damage.

This Chapter includes cleaning, disinfection, and sterilization procedures for endoscopic equipment related to safety and health.

7.1 Appliances for Cleaning, Disinfection and Sterilization

□ Preparation of appliances

Prepare the appliances as shown in Figure 7.1 before cleaning, disinfection or sterilization.

Caution

- Use a basin that is at least 80 cm x 50 cm (32" x 20") in size and deep enough to fully submerge the entire endoscope.

Necessary equipment

- Personal protective equipment
- 500 cm³ (500mL) container
- Large basin with a sealed lid
80x50 cm (32"x20")
- Small basin with a sealed lid
- Clear water
- Detergent
- Disinfectant solution
- Sterile water
- 75%-95% ethanol or isopropanol
- Brush
- Clean lint-free cloth
- Sterile lint-free cloth
- Sterile cotton swab
- 50 cm³ (50 mL) syringe

□ **Cleaning, disinfection and sterilization appliances and functions**

For the inspection of the appliances not mentioned below, please refer to the user manuals of all the equipment.

● **Waterproof cover**

When cleaning, disinfecting and sterilizing, connect the waterproof cover to the electrical connector of the endoscope to prevent water from entering the connector. When conducting a water leakage test, the ventilation interface of the waterproof cover must be connected to the flexible endoscope's leak detector (as shown in Figure 7.2).

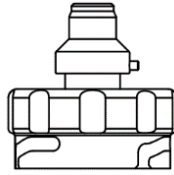


Figure 7.2

- **Channel plug/tube plug**

The channel plug is used to block the clamp pipe opening, the opening of the air/water delivery and suction interfaces during cleaning (as shown in Figure 7.3).

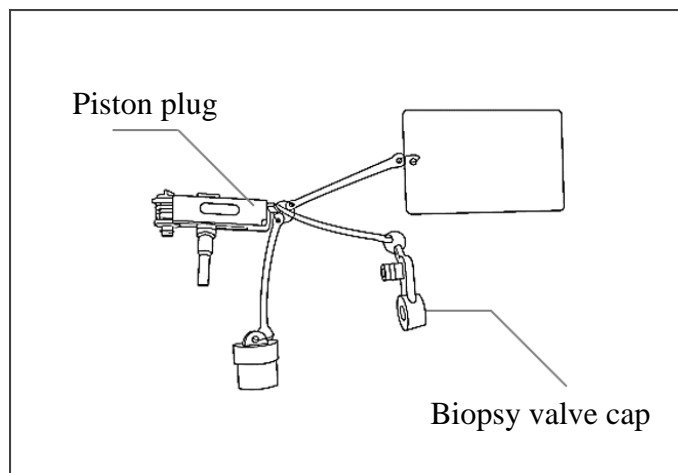


Figure 7.3

- **Tube cleaning brush/channel brush**

The tube cleaning brush is used to scrub the interiors of the clamp pipe and suction channel, and the inner sides or openings of the Suction button, Air/Water Delivery button and clamp pipe opening (as shown in Figure 7.4).

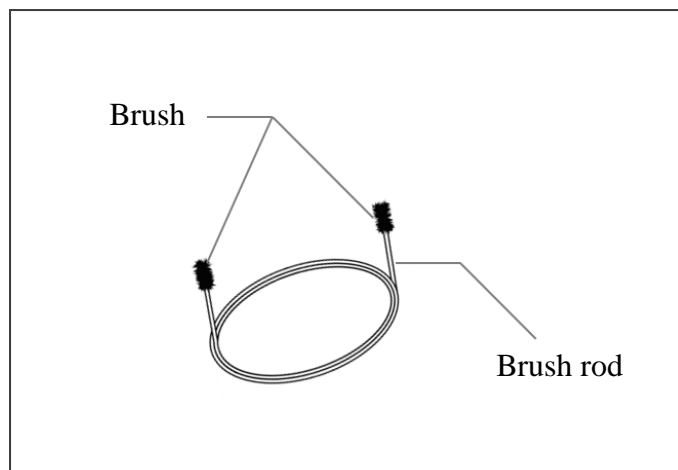


Figure 7.4

- **Cleaning brush**

The cleaning brush is used to scrub the suction interface and clamp pipe opening (as shown in Figure 7.5).

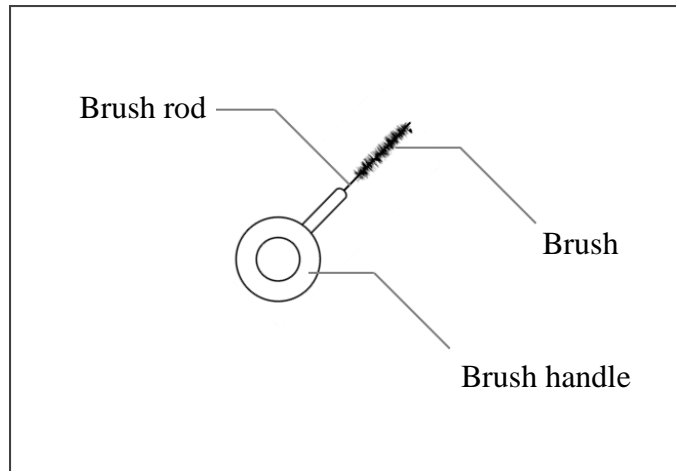


Figure 7.5

- **Suction cleaning joint**

The suction cleaning joint is used to suck out the cleaning, disinfectant and sterilant solutions from the tip of the endoscope through the clamp pipe (as shown in Figure 7.6).

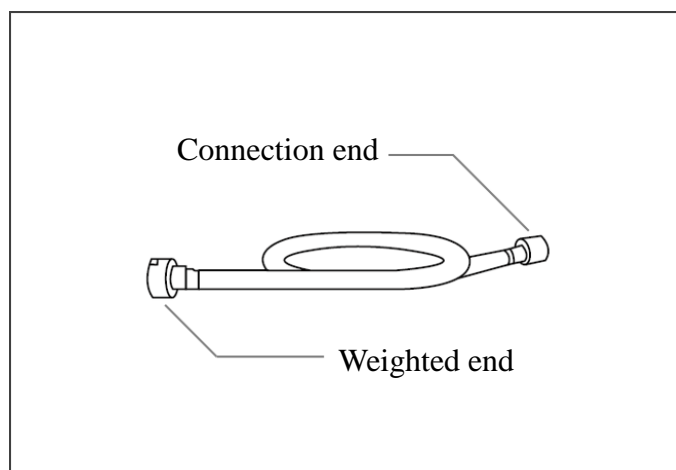


Figure 7.6

□ **Checking the appliances**

For the inspection of the appliances not mentioned below, please refer to their respective user

Warning

- All the equipment listed below are consumables. Even if minor

abnormalities are detected, spare parts need to be replaced. Using defective equipment can make it difficult to effectively clean, disinfect and sterilize endoscopes, and may lead to damage to endoscopes or the equipment.

Caution

- Do not immerse the waterproof cover alone. The water vapor remaining on the inner wall of the waterproof cover can enter the electrical connectors, causing damage to the equipment.

● **Checking the waterproof cover**

1. Confirm that the inner wall of the waterproof cover is completely dry and free of adhering debris (as shown in Figure 7.2). If there is water or debris inside the waterproof cover, please dry it with a dry lint-free cloth.
2. Make sure that the sealing ring inside the waterproof cover has no scratches, fissures or debris.
3. Check that the ventilation interface is not loose.
4. Confirm that the threads of the waterproof cover have no deformation or other cracks.

● **Checking the tube plug**

Confirm that the piston plug and clamp pipe opening have no cracks, scratches, fissures or debris (as shown in Figure 7.3).

● **Checking the tube cleaning brush**

1. Make sure that the brush head and the metal head of the tip are firmly connected. Check whether the brush is loose or fallen off (as shown in Figure 7.4).
2. Check whether the brush rod is bent, scratched or otherwise damaged.
3. Check whether there are any debris adhering to the brush rod or bristles.

● **Checking the tube opening cleaning brush**

1. Check whether the brush head is loose or fallen off (as shown in Figure 7.5).
2. Check whether the brush rod is bent, scratched or otherwise damaged.

3. Check whether there are any debris adhering to the brush rod or bristles.

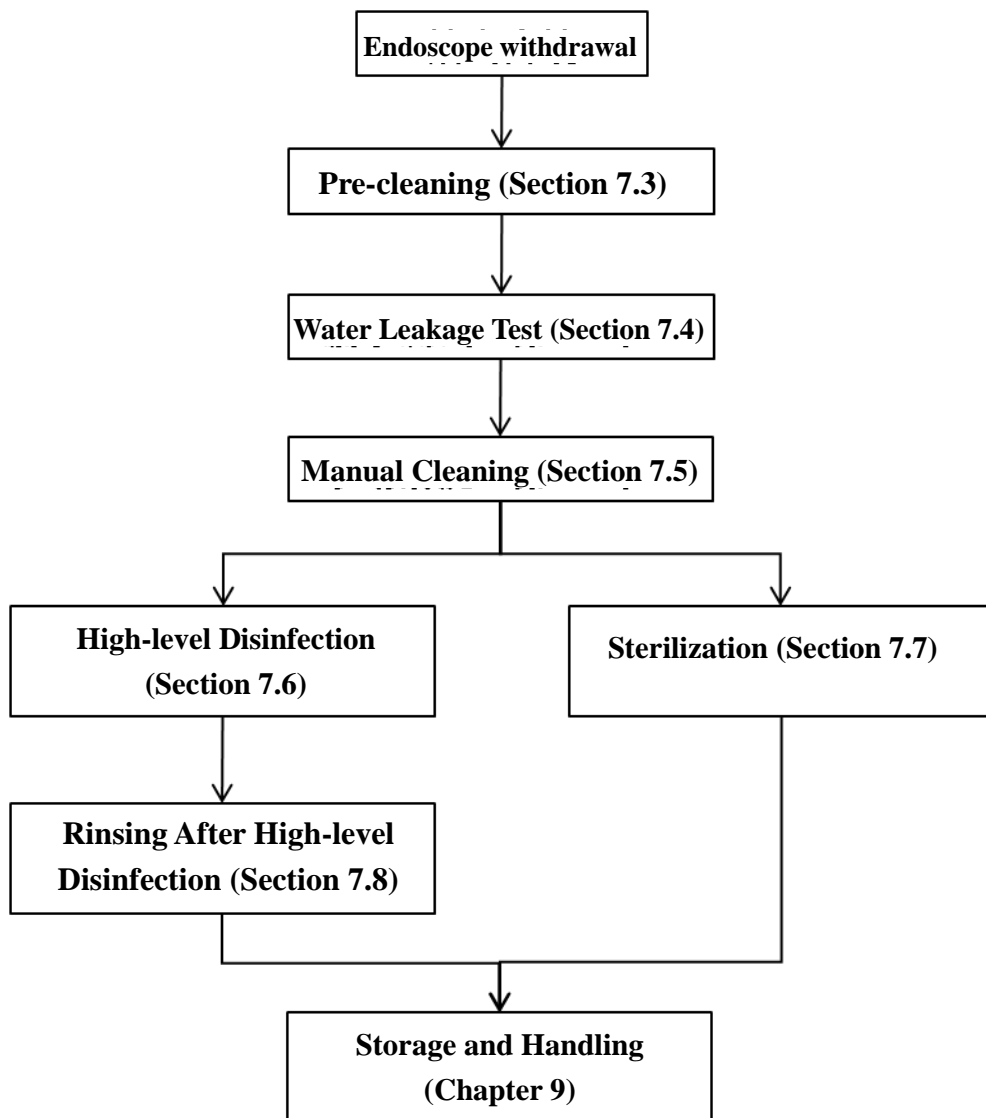
- **Checking the suction cleaning joint**

Check for cracks, scratches, fissures, debris and other damages (as shown in Figure 7.6).

7.2 Cleaning, Disinfection and Sterilization Procedures for Endoscopes

Clean, disinfect and sterilize the endoscope in accordance with the following procedures.

Schematic diagram of the cleaning, disinfection and sterilization procedures for endoscopes



Warning

- All the tubes of the endoscope must be cleaned and disinfected or sterilized at high levels during each cleaning, disinfection and sterilization process, even if some tubes were not used in the

previous case. Otherwise, improper cleaning, disinfection or sterilization of the endoscope may pose an infection risk to the next animal or operator using the endoscope.

7.3 Pre-cleaning

Warning

- If the endoscope is not cleaned in time after each use, the remaining tissue debris will solidify, making it difficult to effectively clean, disinfect and sterilize the endoscope.

After each use, the endoscope shall be pre-cleaned immediately in the operating room.

□ Required appliances

The following appliances shall be prepared and appropriate personal protective equipment shall be worn.

- Personal protective equipment
- 500 cm³ (500 mL) container
- Detergent solution
- Clear water
- Clean lint-free cloth
- Suction pump
- 50 cm³ (50 mL) syringe

□ Preparation

1. Withdraw the endoscope from the disposable sliding tube (if used).
2. Remove the air delivery tube of the disposable sliding tube from the balloon control device (if used), and discard the disposable sliding tube in accordance with all national and local laws and regulations.
3. Turn off the image processor and the light source.
4. Turn off the amplification controller and the endoscope insertion shape observation device.

5. Prepare the detergent solution in a 500 cm³ (500mL) container according to the temperature and concentration recommended by the detergent manufacturer.
6. Prepare clear water in a 500 cm³ (500mL) container.

□ **Cleaning the insertion section**

Warning

- Hold the insertion section carefully. Firmly gripping or excessively bending the insertion section or the bending section may cause serious damage to the rubber of the insertion section or the bending section.

Wipe the entire insertion section with a clean lint-free cloth dipped in detergent, from the protective sleeve of the operation section to the entire insertion section of the tip.

□ **Sucking the detergent solution**

Caution

- Carefully observe the suction bottle on the suction pump to avoid overflow. Otherwise, it will cause damage to the suction pump.

1. Turn on the suction pump.
2. Install the biopsy valve cap.
3. Insert the tip into the detergent solution. Press the Suction button and suck detergent into the clamp pipe for about 50 seconds. (As shown in Figure 7.7)
4. Remove the tip part from the detergent. Press the Suction button and perform air suction for 10 seconds.
5. Turn off the suction pump.

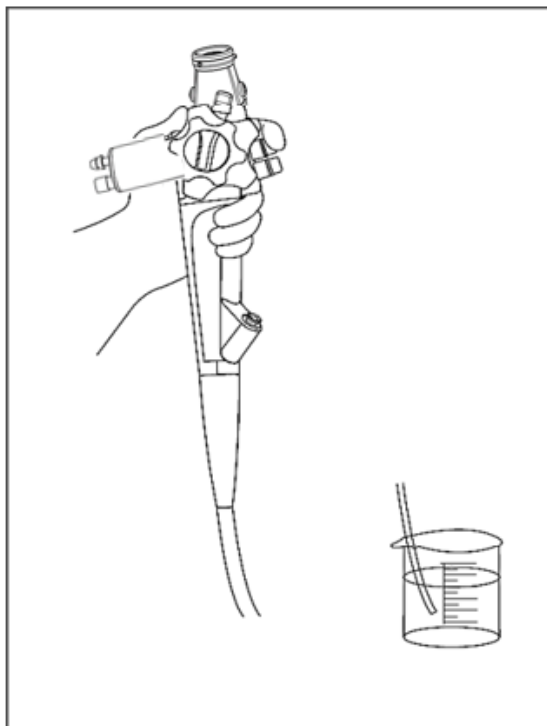


Figure 7.7

□ Disassembling the endoscope, reusable components and appliances for cleaning, disinfection and sterilization

1. Remove the flexible endoscope cable from the electrical connector of the endoscope.
2. Remove the suction tube from the suction joint of the operation section.
3. Remove the metal head of the water bottle from the air/water delivery connector of the operation section, and then install the metal head onto the pointed socket on the cap of the water bottle according to the user manual of the water bottle.
4. Transport the endoscope to the cleaning, disinfection and sterilization area.
5. Remove the Suction button and biopsy valve cap from the endoscope, and then place them in the container containing the detergent solution.

7.4 Water Leakage Test

After pre-cleaning, conduct a water leakage test on the endoscope to ensure its water resistance.

□ Required appliances

Prepare the following appliances and wear appropriate personal protective equipment.

- Personal protective equipment
- Large basin with a sealed lid
- Clear water
- Maintenance device or portable air pump
- Leak detector
- Waterproof cover

□ Installing the waterproof cover

Caution

- The electrical connector of the endoscope is not waterproof, and thus be sure to cover it with a waterproof cover before immersing the endoscope or conducting a water leakage test. Otherwise, it will cause damage to the equipment.
 - If there are scratches on the outside of the electrical connector, the connector may no longer be waterproof and may scratch the sealing gasket inside the waterproof cover. If the electrical connector is scratched, it shall be sent to us for repair immediately.
 - Be sure to use a dry waterproof cover. Water droplets remaining on the waterproof cover can cause damage to the endoscope, maintenance device or portable air pump.
1. Confirm that the inner wall of the waterproof cover is completely dry and free of adhering

debris. If there is water or debris adhering to the inner wall of the waterproof cover, dry it with a dry lint-free cloth.

2. Align the slot on the waterproof cover with the protrusion on the electrical connector.
3. Press the waterproof cover and rotate it clockwise to the end. The rotation stroke is approximately 45°, as shown in Figures 7.8(1) and (2).

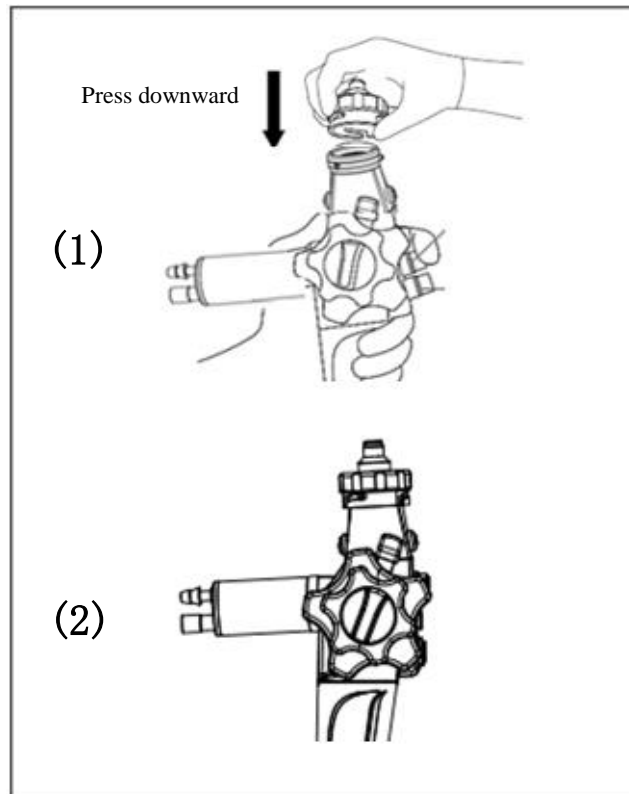


Figure 7.8

□ Water leakage test

Caution

- When conducting a water leakage test, if there are continuous bubbles emerging from a certain part of the endoscope, it indicates that there is a leakage at that location. It indicates that water can enter the interior of the endoscope. If water leakage is found, remove the endoscope from the water and contact us.
- Do not connect or disassemble the waterproof cover or the leak detector interface cover when it is immersed in water. Otherwise,

water will enter the endoscope and cause damage to the equipment.

- The interface cover of the leak detector must be fully tightened to the end. If the connection is improper, it will prevent pressure from being applied inside the endoscope, making it impossible to conduct an accurate water leakage test.
- When connecting the interface cover of the leak detector to the ventilation interface of the waterproof cover, ensure that the inner side of the interface cover of the leak detector and the outer side of the ventilation interface of the waterproof cover are completely dry. Residual water droplets may penetrate the waterproof cover, causing malfunction of the endoscope.
- When the leak detector interface is connected, the bending section rubber will expand with the increase of air pressure inside the endoscope, which is a normal phenomenon.

Description

1. Put clear water in a basin that is at least 80 cm × 50 cm (32" × 20") in size and deep enough to submerge the entire endoscope.

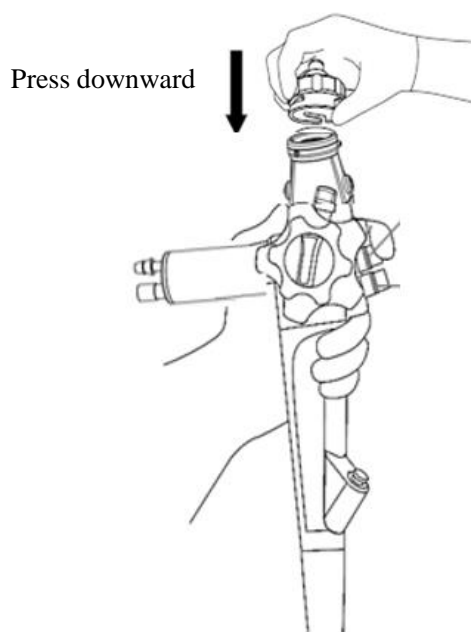


Figure 7.9

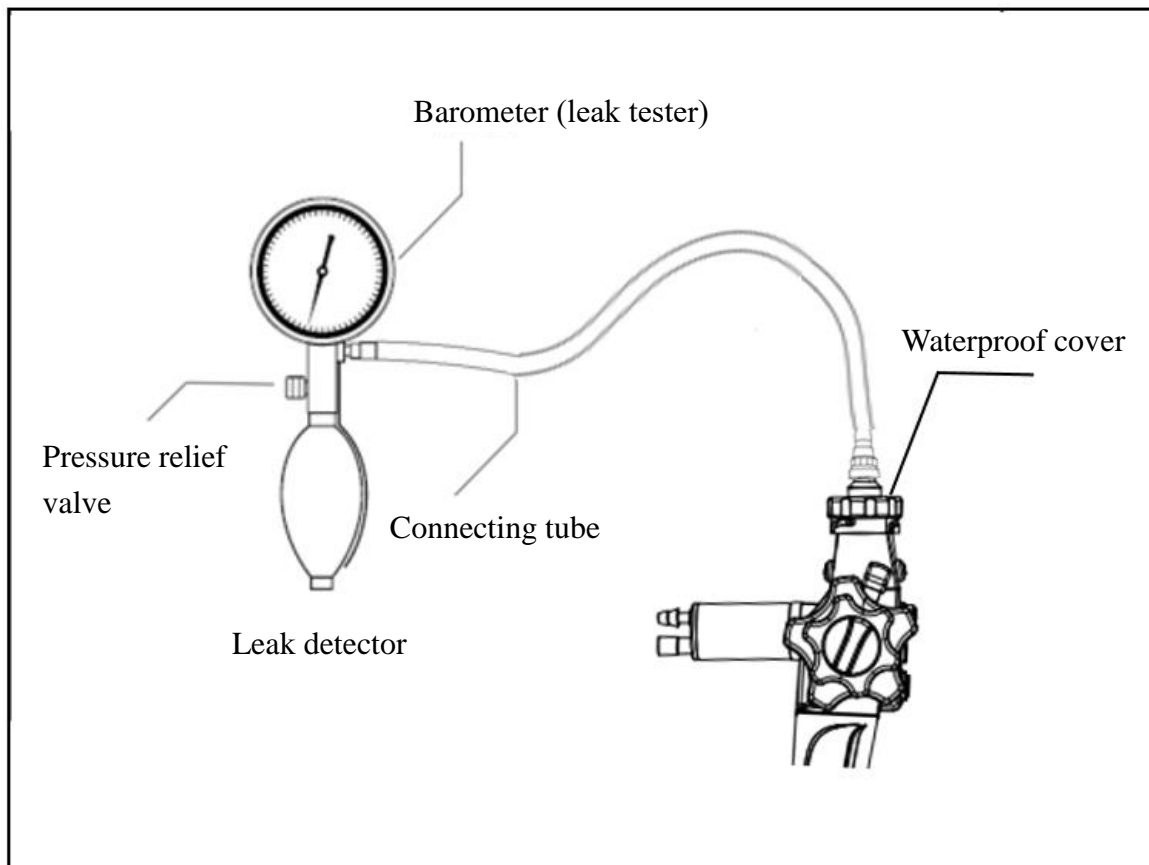


Figure 7.10

2. Make sure that there is no water on the inner side of the interface cover of the leak detector.
3. Make sure that there is no water on the outer side of the ventilation interface of the waterproof cover. Cover the waterproof cover with the electrical connector of the light guide plug, and connect the interface cover of the leak detector to the ventilation interface of the waterproof cover through the connecting tube (as shown in Figures 7.9 and 7.10).
4. Confirm that the air pressure relief valve has been closed. Press the balloon until the pressure display screen indicates between 200mmHg and 240mmHg. If it is tested to leak water slightly, it shall be pressurized to about 240mmHg. Stabilize the pointer for a few seconds after applying pressure. Read the pressure when the pointer is stable.

Caution

- If the pointer continues to drop to 0mmHg, it indicates that the endoscope may have a serious water leak or the leak detector may be damaged. The leak test shall be stopped immediately. If the endoscope is still immersed in water, water will enter the endoscope

without pressure inside the endoscope. As a result, more serious problems may occur and even irreparable damages to the endoscope may be caused.

- If bubbles continuously emerge from the leak detection cover during the leak test, the leak detection cover or leak detection connector may be damaged. Replace the leak detection cover in time or contact the manufacturer for repair.
5. Immerse the endoscope connected to the leak detector in water and observe it for 30 seconds while bending the bending section to ensure that no continuous bubbles emerge from the endoscope.
 6. Remove the endoscope connected to the leak detector from the basin.
 7. Rotate the air pressure relief valve to release the air pressure from the endoscope.
 8. Rotate the leak detection cover counterclockwise to remove the leak detection cover from the leak detection connector of the endoscope.
 9. Thoroughly dry the endoscope and related leak detection assemblies.

7.5 Cleaning

7.5.1 Manual cleaning

Caution

- To avoid water leakage, do not forcibly clean the endoscope.

After the water leakage test is completed, manual cleaning shall be carried out according to the following procedures.

If there is excessive hemorrhage or delays in cleaning, disinfection and sterilization, a “pre-immersion during excessive hemorrhage or delays in cleaning, disinfection and sterilization after each use” shall be carried out first, followed by the following procedures.

Reusable components that can usually be cleaned, disinfected and sterilized together with the endoscope

- Tube plug
- Perfusion tube
- Waterproof cover
- Waterproof cover connection chain

Required appliances

Prepare the following appliances and wear appropriate personal protective equipment.

- Personal protective equipment
- Large basin with a sealed lid
- Detergent solution
- Clear water
- Soft-bristled brush
- Clean lint-free cloth

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- Tube cleaning brush
- Clamp pipe opening cleaning brush
- Suction cleaning joint
- Tube plug
- Perfusion tube
- 50 cm³ (50 mL) syringe
- Suction pump

Caution

- Do not immerse the endoscope together with any components other than the above-mentioned appliances to avoid damaging the endoscope.

□ Preparation

1. Put the detergent solution in a basin at the temperature and concentration recommended by the detergent manufacturer. Use a basin that is at least 80 cm × 50 cm (32" × 20") in size and deep enough to fully submerge the entire endoscope.
2. Put clear water in the basin. Use a basin that is at least 80 cm × 50 cm (32" × 20") in size and deep enough to fully submerge the entire endoscope.

□ Cleaning the outer surface

1. Immerse the endoscope in the detergent solution.
2. In the detergent solution, thoroughly scrub or wipe the entire outer surface of the endoscope with a soft-bristled brush or lint-free cloth. Special attention shall be paid to the opening of the air/water delivery nozzle and the objective lens, and ensure that all surfaces of the tip have been thoroughly cleaned (as shown in Figure 7.11).

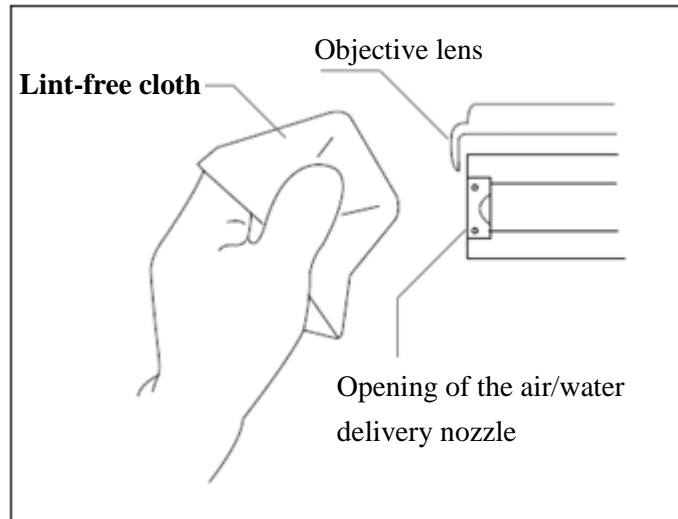


Figure 7.11

□ Scrubbing the tube

Warning

- Make sure to scrub the interiors of the clamp pipe and suction tube. Otherwise, inadequate cleaning and disinfection of the endoscope may pose an infection risk to the next animal or operator using the endoscope.
- To prevent the detergent solution from splashing out when withdrawing the tube cleaning brush, the cleaning brush shall be withdrawn in water.
- The tube cleaning brush is a consumable. Repeated use may cause the brush head to bend or tangle, and even fall off during use. Before and after each use, make sure that the cleaning brush is undamaged or has no other abnormalities. If the brush head falls off into the endoscope after scrubbing, it shall be immediately identified and a new cleaning brush or other endoscopic diagnostic and therapeutic accessories shall be used to pass through the tube to confirm that there are no foreign objects left in the endoscopic tube. If any component is left in the tube, it may fall into the animal's body during use. Due to different locations, it may not be possible to remove the

detached part through a new cleaning brush or other endoscopic diagnostic and therapeutic accessories. In this case, please contact us.

Caution

- Gently withdraw the tube cleaning brush from the clamp pipe or suction tube to ensure that the brush rod does not rub against the external opening of the suction interface. Otherwise, it will cause damage to the cleaning brush and grind indentations at the opening, affecting the suction effect and causing water leakage.
- Do not attempt to pass through the tube cleaning brush from the tip of the insertion section or suction joint. Otherwise, it will cause the cleaning brush to get stuck and be unable to return to its original position.

During the immersion of the endoscope, brush the appliances and suction tube, suction interface and clamp pipe opening according to the following procedures (as shown in Figure 7.12).

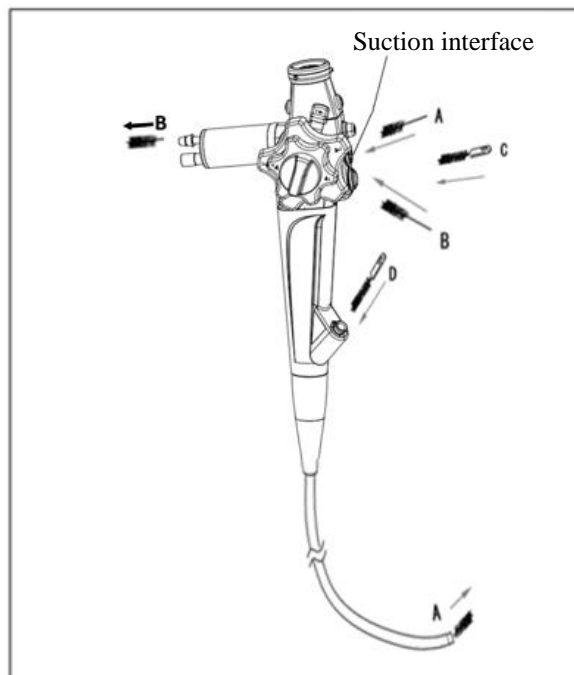


Figure 7.12

A. Scrubbing the clamp pipe of the insertion section and the clamp pipe of the operation section (location A)

1. Immerse the endoscope in the detergent solution to avoid splashing.
2. Straighten the bending section of the endoscope. Hold the tube cleaning brush 3 cm away from the brush head.
3. As shown in Figure 7.12(A), insert the tube cleaning brush into the opening on the side wall of the suction interface at a 45° angle. Gently tap and insert the cleaning brush from the insertion section until the brush head extends out of the tip of the endoscope.
4. Clean the brush with your fingertips in the detergent solution. Then carefully pull the cleaning brush back from the tube.
5. Clean the brush again in the detergent solution.
6. Repeat several times until all the debris is completely removed.

B. Scrubbing the suction tube of the general-purpose cable (location B)

1. Hold the tube cleaning brush 3 cm away from the brush head.
2. As shown in Figure 7.12(B), insert the tube cleaning brush straight into the opening of the suction interface. Gently tap and insert the general-purpose cable into the cleaning brush until the brush head extends from the suction interface of the light guide plug.
3. Clean the brush with your fingertips in the detergent solution. Then carefully pull the cleaning brush back from the tube.
4. Clean the brush again in the detergent solution.
5. Repeat several times until all the debris is completely removed.

C. Scrubbing the suction interface (location C)

Caution

- When inserting the tube opening cleaning brush into the suction interface, do not force the brush into more than half. Otherwise, the

brush will get stuck in the suction interface.

1. As shown in Figure 7.12(C), insert the tube opening cleaning brush into the clamp pipe opening until the brush handle touches the tube opening.
2. Rotate the cleaning brush once.
3. Withdraw the brush and clean the bristles with your fingertips in the detergent solution.
4. Repeat several times until all the debris is completely removed.

D. Scrubbing the suction interface (location D)

1. As shown in Figure 7.12(D), insert the tube opening cleaning brush into the clamp pipe opening until the brush handle touches the tube opening.
2. Rotate the cleaning brush once.
3. Withdraw the brush and clean the bristles with your fingertips in the detergent solution.
4. Repeat several times until all the debris is completely removed.
5. The tube opening cleaning brush shall be cleaned, disinfected and sterilized in accordance with the instructions in Section 7.9 “Cleaning, Disinfection and Sterilization Procedures for Reusable Components and Cleaning, Disinfection and Sterilization Appliances”.

Caution

- According to the instructions in Section 7.9 “Cleaning, Disinfection and Sterilization Procedures for Reusable Components and Cleaning, Disinfection and Sterilization Appliances”, the tube cleaning brush is used to scrub the accessories of the endoscope.

6. Remove the endoscope from the detergent solution.

□ Introducing the detergent solution into the clamp pipe and suction tube

1. Connect the suction cleaning joint to the clamp pipe opening (as shown in Figure 7.13).
2. Connect the suction tube of the suction pump to the suction interface of the light guide

plug. Turn on the suction pump.

3. Immerse the tip of the endoscope and the weighted end of the suction cleaning joint in the detergent solution.
4. Block the suction interface with your finger and suck the detergent solution for about 50 seconds.
5. Release your finger from the suction interface.
6. Turn off the suction pump.
7. Remove the suction tube and the suction cleaning joint.
8. The suction cleaning joint shall be cleaned, disinfected and sterilized in accordance with the instructions in Section 7.9 “Cleaning, Disinfection and Sterilization Procedures for Reusable Components and Cleaning, Disinfection and Sterilization Appliances”.

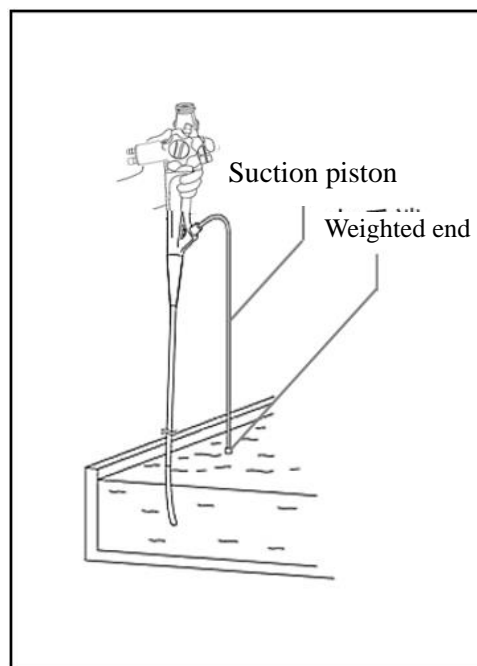


Figure 7.13

□ Rinsing the air/water delivery tube with the detergent solution

1. Install the biopsy valve cap onto the tube plug to the clamp pipe opening (as shown in Figure 7.20).

2. Install the piston plug of the tube plug on the air/water delivery and suction interfaces (as shown in Figure 7.20).
3. Press the plug of the operation section of the endoscope and slide the plug to the end (as shown in Figure 7.20).

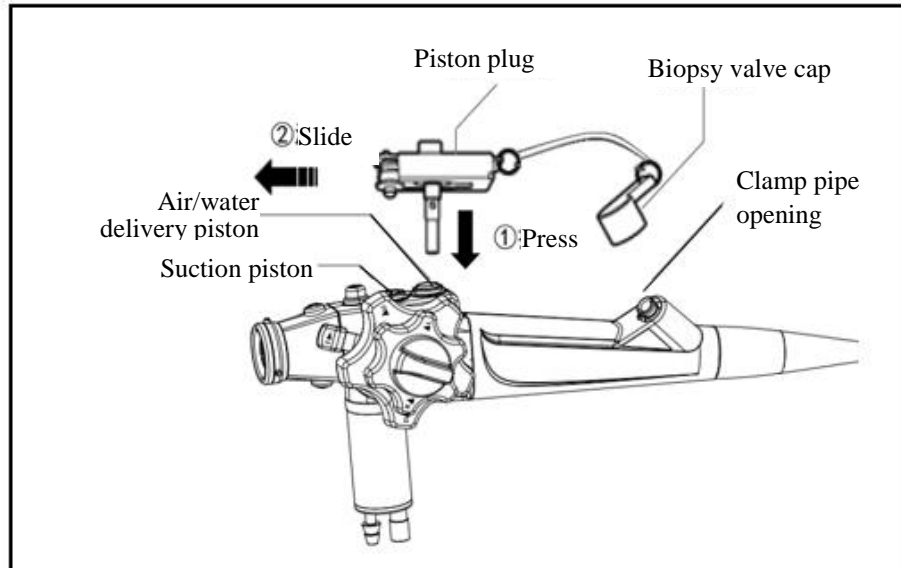


Figure 7.20

4. Install the interface plug of the perfusion tube to the water and air delivery connectors on the light guide plug.
5. Install the air delivery tube opening of the perfusion tube to the air delivery tube of the light guide plug.
6. Connect the suction tube of the perfusion tube to the suction interface of the catheter plug.
7. Immerse the suction interface of the perfusion tube into the detergent solution.
8. Install the 50 cm³ (50 mL) syringe into the air/water delivery tube opening of the perfusion tube.
9. Inject 150 cm³ (150 mL) of detergent solution into the air/water delivery tube.
10. Remove the tube plug and perfusion tube from the endoscope and immerse all components.

□ Immersing the endoscope and all cleaning, disinfection and sterilization appliances in the detergent solution

1. While the endoscope is immersed in the detergent solution, use a lint-free cloth to wipe off all debris on the outer surface of the endoscope.
2. Cover the basin with a sealed lid to minimize the evaporation of the detergent solution.
3. Immerse the endoscope and all cleaning, disinfection and sterilization appliances as per the time, temperature and concentration recommended by the detergent manufacturer.
4. Remove the endoscope and all cleaning, disinfection and sterilization appliances from the detergent solution.
5. Check the endoscope and all cleaning, disinfection and sterilization appliances. If there are still debris remaining, repeat procedures 1 to 5 above.
6. Put all appliances into clear water and gently stir to thoroughly rinse.

□ Draining the detergent solution from all tubes

1. Install the tube plug and the perfusion tube into the endoscope. Insert the suction interface of the perfusion tube into clear water. Install the biopsy valve cap of the tube plug to the clamp pipe opening (as shown in Figure 7.20).
2. Install the 50 cm³ (50 mL) syringe into the air/water delivery tube opening of the perfusion tube, and inject 150 cm³ (150 mL) of clear water into the air/water delivery tube.
3. Install the 50 cm³ (50 mL) syringe into the suction tube opening of the perfusion tube, and inject 150 cm³ (150 mL) of clear water into the suction tube.
4. Remove the endoscope and all its components from the water.
5. Cover the tip and operation section of the endoscope with a clean lint-free cloth.
6. A 50 cm³ (50 mL) syringe is used to inject 150 cm³ (150 mL) of air into the air/water delivery and suction tubes respectively through the perfusion tube (as shown in Figure 7.20).

7. Remove the clean lint-free cloth from the tip and operation section of the endoscope.
8. Remove the tube plug and perfusion tube from the endoscope.

□ **Drying the outer surface**

1. Thoroughly dry the outer surfaces of the endoscope and all appliances with a clean lint-free cloth.
2. Check the endoscope and all appliances for any remaining debris. If there are still debris, repeat the content of this Section.

7.5.2 Automatic cleaning

Refer to the manual of the automatic cleaning equipment for relevant operations.

□ **Pre-immersion during excessive hemorrhage or delays in cleaning, disinfection and sterilization after each use**

Caution

- The following procedures can only be carried out during excessive hemorrhage or delays in cleaning, disinfection and sterilization; unnecessary immersion shall be avoided. Prolonged immersion can cause damage to the endoscope.
1. Put the detergent in a basin at the temperature and concentration recommended by the detergent manufacturer. The basin shall be at least 80cm x 50 cm (32" x 20") in size and deep enough to submerge the entire endoscope.
 2. Carefully coil the insertion section of the endoscope and the general-purpose cable, and completely immerse the endoscope in the detergent solution.
 3. Send the detergent solution to all channels according to the procedure described in this Section.
 4. Only remove the cleaning, disinfection and sterilization appliances from the detergent solution.

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5. Cover the basin with a sealed lid to minimize the evaporation of the detergent solution.
6. Immerse the endoscope for about 10 hours at the temperature and concentration recommended by the detergent manufacturer.
7. Remove the endoscope from the detergent solution.
8. After immersion, clean the endoscope manually or using the automatic cleaning equipment according to the procedure in this Section.

7.6 High-level Disinfection

7.6.1 Manual disinfection

Warning

- During the entire disinfection process, the endoscope and all appliances must be completely immersed in the disinfectant solution. During immersion, if the appliance is connected to the endoscope or any part of the appliance is not completely immersed in the disinfectant solution, then the disinfectant solution cannot fully contact all the outer surfaces of the appliance.

After manual cleaning, disinfect the endoscope according to the following procedures.

Required appliances

Prepare the following appliances and wear appropriate personal protective equipment.

- Personal protective equipment
- Large basin with a sealed lid
- Disinfectant solution
- Tube plug
- Perfusion tube
- Clean lint-free cloth
- 50 cm³ (50 mL) syringe

Preparation

1. Fill the basin with disinfectant solution at the temperature and concentration recommended by the disinfectant manufacturer. The basin shall be at least 80 cm x 50 cm (32" x 20") in size and deep enough to submerge the entire endoscope.
2. Install the tube plug and the perfusion tube into the endoscope. Install the biopsy valve

cap of the tube plug to the clamp pipe opening (as shown in Figure 7.20).

□ Delivering the disinfectant solution to all tubes

Warning

- Completely remove all bubbles in the tube. Otherwise, bubbles will affect the disinfection efficiency of the tube surface.

Description

- Injecting the disinfectant solution into the tube forcefully can remove bubbles.

1. Immerse the endoscope and all appliances in the disinfectant solution.
2. Confirm that the suction interface of the perfusion tube is immersed in the disinfectant solution.
3. A 50 cm³ (50 mL) syringe is used to inject 150 cm³ (150 mL) of disinfectant solution into the air/water delivery and suction tubes respectively through the perfusion tube. Confirm that there are no bubbles coming out of the tip of the endoscope.

□ Immersing the endoscope and all appliances in the disinfectant solution

Warning

- During the entire disinfection process, the endoscope and all appliances shall be completely immersed in the disinfectant solution. If the appliance is removed without being completely immersed, then the disinfectant solution cannot fully contact all surfaces of the appliance, thereby affecting the disinfection effect.

1. Completely immerse the endoscope and all appliances in the disinfectant solution and remove all appliances from the endoscope. Immerse the endoscope and all appliances in the disinfectant solution.
2. If there are bubbles adhering to the surface of the endoscope or appliance, wipe them off with a clean lint-free cloth.
3. Cover the basin with a sealed lid to minimize the evaporation of the disinfectant solution.
4. Immerse the endoscope and all appliances in the disinfectant solution as per the time,

temperature and concentration recommended by the disinfectant manufacturer. We recommend immersion in a 0.5% to 0.6% (w/v) O-phthalaldehyde disinfectant solution for disinfection, and the immersion time at room temperature shall be more than 5 minutes.

□ **Removing the endoscope and all appliances from the disinfectant solution**

1. Before removing the endoscope from the disinfectant solution, connect the tube plug and the perfusion tube to the endoscope. Install the biopsy valve cap of the tube plug to the clamp pipe opening.
2. Remove the suction interface of the perfusion tube from the disinfectant solution.
3. A 50 cm³ (50 mL) syringe is used to inject 150 cm³ (150 mL) of air into the air/water delivery and suction tubes respectively through the perfusion tube.
4. Remove the endoscope and all appliances from the disinfectant solution.
5. Remove all appliances from the endoscope.

7.6.2 Automatic disinfection

Refer to the manual of the automatic disinfection equipment for relevant operations.

7.7 Sterilization

In addition to high-level disinfection, endoscopes can also be sterilized by peracetic acid immersion. After manual or automatic cleaning and drying in accordance with the contents of Section 7.3 “Pre-cleaning”, Section 7.4 “Water Leakage Test” and Section 7.5 “Cleaning”, proceed with the following procedures.

Warning

- During the entire sterilization process, the endoscope and all appliances must be completely immersed in the sterilant solution. During immersion, if the appliance is connected to the endoscope or any part of the appliance is not completely immersed in the sterilant solution, then the sterilant solution cannot fully contact all the outer surfaces of the appliance.

Required appliances

Prepare the following appliances and wear appropriate personal protective equipment.

- Personal protective equipment
- Large basin with a sealed lid
- Sterilant solution
- Tube plug
- Perfusion tube
- Clean lint-free cloth
- 50 cm³ (50 mL) syringe

Preparation

1. Fill the basin with sterilant solution at the temperature and concentration recommended by the sterilant manufacturer. The basin shall be at least 80 cm × 50 cm (32" × 20") in size

and deep enough to submerge the entire endoscope.

2. Install the tube plug and the perfusion tube into the endoscope. Install the biopsy valve cap of the tube plug to the clamp pipe opening.

□ Delivering the sterilant solution to all tubes

Warning

- Completely remove all bubbles in the tube. Otherwise, bubbles will affect the sterilization efficiency of the tube surface.

Description

- Injecting the sterilant solution into the tube forcefully can remove bubbles.

1. Immerse the endoscope and all appliances in the sterilant solution.
2. Confirm that the suction interface of the perfusion tube is immersed in the sterilant solution.
3. A 50 cm³ (50 mL) syringe is used to inject 150 cm³ (150 mL) of sterilant solution into the air/water delivery and suction tubes respectively through the perfusion tube. Confirm that there are no bubbles coming out of the tip of the endoscope.

□ Immersing the endoscope and all appliances in the sterilant solution

Warning

- During the entire sterilization process, the endoscope and all appliances shall be completely immersed in the sterilant solution. If the appliance is removed without being completely immersed, then the sterilant solution cannot fully contact all surfaces of the appliance, thereby affecting the sterilization effect.

1. Completely immerse the endoscope and all appliances in the sterilant solution and remove all appliances from the endoscope. Immerse the endoscope and all appliances in the sterilant solution.
2. If there are bubbles adhering to the surface of the endoscope or appliance, wipe them off with a clean lint-free cloth.
3. Cover the basin with a sealed lid to minimize the evaporation of the sterilant solution.

4. Immerse the endoscope and all appliances in the sterilant solution as per the time, temperature and concentration recommended by the disinfectant manufacturer. We recommend immersion in a peracetic acid solution with an effective concentration of peracetic acid of no less than 0.2% to 0.35% for sterilization, and the immersion time shall be more than 20min.

□ **Removing the endoscope and all appliances from the sterilant solution**

1. Before removing the endoscope from the sterilant solution, connect the tube plug and the perfusion tube to the endoscope. Install the biopsy valve cap of the tube plug to the clamp pipe opening.
2. Remove the suction interface of the perfusion tube from the disinfectant solution.
3. A 50 cm³ (50 mL) syringe is used to inject 150 cm³ (150 mL) of air into the air/water delivery and suction tubes respectively through the perfusion tube.
4. Remove the endoscope and all appliances from the sterilant solution.
5. Remove all appliances from the endoscope.

□ **Automatic sterilization**

Refer to the manual of the automatic sterilization equipment for relevant operations.

7.8 Rinsing After High-level Disinfection or Sterilization

Warning

- After cleaning, disinfection and sterilization, clean and thoroughly air dry the tubes of the endoscope. Otherwise, bacteria will breed inside the tube, posing an infection risk to the next animal or operator using the endoscope.

After high-level disinfection, rinse the endoscope and all appliances according to the following procedures.

Use water with qualified microbiological quality. When removing the appliance from disinfectant solution, it shall be thoroughly rinsed with sterile water immediately to remove the remaining disinfectant solution. If sterile water is not available, clean drinking water or water that has been treated (such as filtered) to improve the microbiological quality can be used in combination with 75%-95% ethanol or isopropanol (please refer to the content of "Rinsing with non-sterile water and alcohol"). At the same time, please consult the relevant infection control department of your hospital.

□ Required appliances

Prepare the following appliances and wear appropriate personal protective equipment.

- Personal protective equipment
- Sterile large basin with a sealed lid
- Sterile water for sterile water rinsing
- Sterile lint-free cloth
- Tube plug
- Perfusion tube
- 50 cm³ (50 mL) syringe
- Suction pump (with sterile suction tube)

If sterile water is not available, prepare the following appliances.

- Clear water for non-sterile water rinsing.
- Small basin with a sealed lid
- 75%-95% ethanol or isopropanol
- Sterile cotton swab

Warning

- Alcohol is flammable. Safety must be given top priority when in use.

□ Rinsing with sterile water

1. Put sterile water in the basin. The basin shall be at least 80 cm × 50 cm (32" × 20") in size and deep enough to submerge the entire endoscope.
2. Immerse the endoscope, tube plug and perfusion tube in sterile water. Thoroughly rinse and scrub all outer surfaces with a sterile lint-free cloth.
3. Install the tube plug and the perfusion tube into the endoscope. Insert the suction interface into sterile water. Install the biopsy valve cap of the tube plug to the clamp pipe opening.
4. A 50 cm³ (50 mL) syringe is used to inject 150 cm³ (150 mL) of sterile water into the air/water delivery and suction tubes respectively through the perfusion tube.
5. Remove the endoscope and all its appliances from the sterile water and place them in a large sterile basin.
6. Cover the tip and operation section of the endoscope with a sterile lint-free cloth.
7. A 50 cm³ (50 mL) syringe is used to inject 150 cm³ (150 mL) of air into the air/water delivery and suction tubes respectively through the perfusion tube.
8. Remove the sterile lint-free cloth from the tip and operation section of the endoscope.
9. Only remove the perfusion tube. Connect the sterile suction tube from the suction pump to the suction joint of the endoscope. Turn on the suction pump and perform air suction for at least 15 seconds.

10. Turn off the suction pump and remove all appliances from the endoscope.
11. Thoroughly dry the outer surfaces of the endoscope and all appliances with a sterile lint-free cloth.
12. Dry the endoscope and all appliances completely.
13. Store the components in accordance with the content of Chapter 9 “Storage and Handling of the Endoscope”.

Description

- Rinsing the tube with sterile water and then with 75%-95% ethanol or isopropanol will help dry the inside of the tube.

□ Rinsing with non-sterile water and alcohol

1. Put sterile water in the basin. The basin shall be at least 80cm × 50 cm (32" × 20") in size and deep enough to submerge the entire endoscope.
2. Immerse the endoscope and all appliances in the clear water. Thoroughly rinse and scrub all outer surfaces with a sterile lint-free cloth, and proceed with Procedures 2 to 11 of “rinsing with sterile water”.
3. Inject 75%-95% ethanol or isopropanol into a small basin.
4. Install the tube plug and the perfusion tube into the endoscope. Install the biopsy valve cap of the tube plug to the clamp pipe opening.
5. Cover the tip and operation section of the endoscope with a sterile lint-free cloth.
6. Immerse the suction interface of the perfusion tube in alcohol. A 50 cm³ (50 mL) syringe is used to inject 150 cm³ (150 mL) of alcohol into the air/water delivery and suction tubes respectively through the perfusion tube.
7. Remove the suction interface of the perfusion tube from the alcohol. A 50 cm³ (50 mL) syringe is used to inject 150 cm³ (150 mL) of air into the air/water delivery and suction tubes respectively through the perfusion tube.
8. Remove the sterile lint-free cloth from the tip and operation section of the endoscope.

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9. Remove all appliances from the endoscope.
10. Thoroughly wipe the outer surfaces of the endoscope and all appliances with a sterile lint-free cloth dipped in alcohol.
11. Use sterile cotton swabs to dry the inner sides of the air/water delivery interface, suction interface and clamp pipe opening.
12. Dry the endoscope and all appliances completely.
13. Store the components in accordance with the content of Chapter 9 “Storage and Handling of the Endoscope”.

7.9 Cleaning, Disinfection and Sterilization Procedures for Reusable Components and Cleaning, Disinfection and Sterilization Appliances

Warning

- After each use, reusable components and cleaning, disinfection and sterilization appliances must be cleaned and subjected to high-temperature disinfection or sterilization treatment. Otherwise, it may pose a risk of infection to the animals or operators.

This Section introduces the cleaning, disinfection and sterilization procedures for the following reusable components and cleaning, disinfection and sterilization appliances.

- Air/Water Delivery button
- Suction button
- Biopsy valve cap
- Tube opening cleaning brush
- Tube cleaning brush
- Suction cleaning joint
- Auxiliary water delivery tube

□ Required appliances

Prepare the following appliances and wear appropriate personal protective equipment.

- Personal protective equipment
- Small basin with a sealed lid
- Clear water
- Detergent solution
- Tube cleaning brush

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- Soft-bristled brush
- Clean lint-free cloth
- 50 cm³ (50 mL) syringe
- Disinfectant solution
- Sterile water for rinsing
- Sterile lint-free cloth

If sterile water is not available, prepare the following appliances.

- Small basin with a sealed lid
- 75%-95% ethanol or isopropanol

□ Manual cleaning

Caution

- Confirm that the components immersed in the detergent solution do not come into contact with each other.
 - Confirm that there are no scratches on the sealing ring on the Air/Water Delivery button.
1. Put clear water in a small basin. The basin shall be deep enough to completely immerse all appliances.
 2. Put the detergent solution in a small basin at the temperature and concentration recommended by the detergent manufacturer. The basin shall be deep enough to completely immerse all appliances.
 3. Before immersing the detergent solution, remove the biopsy valve cap from the main body (as shown in Figure 7.21).

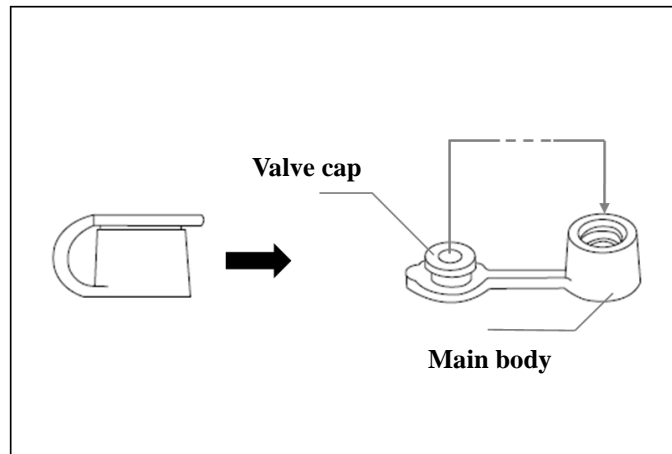


Figure 7.21

4. Immerse the other appliances in the detergent solution.
5. Clean the outer surfaces of all appliances with a soft-bristled brush or a clean lint-free cloth in the detergent solution.
6. Thoroughly scrub the openings of the Suction button and Air/Water Delivery button with a tube cleaning brush until all debris is removed.
7. Thoroughly scrub the inner side and opening of the biopsy valve cap with a tube cleaning brush.
8. While immersing the brush in the detergent solution, thoroughly clean the bristles of the tube cleaning brush and the tube opening cleaning brush.
9. Use a 50 cm³ (50 mL) syringe to rinse the interiors and openings of all appliances until no bubbles emerge.
10. During immersion, press and release the pistons of the Air/Water Delivery button and Suction button. Confirm that all bubbles have been removed.
11. Smooth the bristles of the tube cleaning brush and the tube opening cleaning brush by hand to remove all bubbles.
12. Use a 50 cm³ (50 mL) syringe to inject and rinse the interiors of the suction cleaning joint immersed in the detergent solution. Confirm that all bubbles have been removed.
13. Cover the basin with a sealed lid to minimize the evaporation of the detergent solution.

Immerse all appliances as per the temperature and concentration recommended by the detergent manufacturer.

14. Remove all appliances from the detergent and inspect them. If any remaining debris is found on the appliance, perform ultrasonic cleaning at 33-48kHz for 5 minutes.
15. Immerse all appliances in the clear water.
16. Gently stir and thoroughly rinse all appliances.
17. During immersion, press and release the pistons of the Air/Water Delivery button and Suction button. Confirm that there are bubbles coming out.
18. Smooth the bristles of the tube cleaning brush and the tube opening cleaning brush by hand to remove all bubbles.
19. Use a 50 cm³ (50 mL) syringe to thoroughly rinse the interior of the suction cleaning joint immersed in the clear water. Confirm that all bubbles have been removed.
20. Take out the suction cleaning joint from the clear water, hold the joint and tilt it to drain the remaining clear water on the joint.
21. Immerse all appliances in the clear water.
22. Thoroughly dry the outer surfaces of all appliances with a sterile lint-free cloth.
23. Check all appliances for any remaining debris. If there is any debris remaining on the appliance, repeat the operation until all the debris is removed.

High-level disinfection

Warning

- Remove all bubbles from the appliances completely. If bubbles remain, it will affect the disinfection effect.
- All disinfection procedures shall be carried out when all appliances are completely immersed in the disinfectant solution. If any part of the appliance is not completely immersed, disinfectant solution may not make full contact with all its surfaces.

1. Fill the basin with disinfectant solution at the temperature and concentration recommended by the disinfectant manufacturer. The basin shall be deep enough to completely immerse all appliances. We recommend immersion in a 0.5% to 0.6% (w/v) O-phthalaldehyde disinfectant solution for disinfection, and the immersion time at room temperature shall be more than 5min.
2. Immerse all appliances in the disinfectant solution.
3. Use a lint-free cloth or 50 cm³ (50 mL) syringe to wipe or rinse all outer surfaces in the disinfectant solution to ensure that all bubbles have been removed.
4. Use a 50 cm³ (50 mL) syringe to rinse and immerse the interiors or recesses of all equipment in the disinfectant solution. Confirm that all bubbles have been removed.
5. During immersion, press and release the piston of the button. Confirm that all bubbles have been removed.
6. Use a 50 cm³ (50 mL) syringe to rinse the recesses of the clamp pipe opening immersed in the disinfectant solution. Confirm that all bubbles have been removed.
7. Smooth the bristles of the tube cleaning brush and the tube opening cleaning brush by hand to remove all bubbles.
8. Use a 50 cm³ (50 mL) syringe to thoroughly rinse the interior of the suction cleaning joint immersed in the disinfectant solution to ensure that all bubbles have been removed.
9. Cover the basin with a sealed lid to minimize the evaporation of the disinfectant solution. Immerse all appliances as per the temperature and concentration recommended by the disinfectant manufacturer.
10. Take the suction cleaning joint out of disinfectant solution. Tilt the joint and drain the remaining disinfectant solution inside the joint.
11. Remove all appliances from the disinfectant solution.

Sterilization

Warning

- Remove all bubbles from the appliances completely. If bubbles remain, it will affect the sterilization effect.
 - All sterilization procedures shall be carried out when all appliances are completely immersed in the sterilant solution. If any part of the appliance is not completely immersed, sterilant solution may not make full contact with all its surfaces.
1. Fill the basin with sterilant solution at the temperature and concentration recommended by the disinfectant manufacturer. The basin shall be deep enough to completely immerse all appliances. We recommend immersion in a peracetic acid solution with an effective concentration of hydrogen peroxide of 0.2% to 0.35% for sterilization, and the immersion time shall be more than 20min.
 2. Immerse all appliances in the sterilant solution.
 3. Use a lint-free cloth or 50 cm³ (50 mL) syringe to wipe or rinse all outer surfaces in the sterilant solution to ensure that all bubbles have been removed.
 4. Use a 50 cm³ (50 mL) syringe to rinse and immerse the interiors or recesses of all equipment in the sterilant solution. Confirm that all bubbles have been removed.
 5. During immersion, press and release the piston of the button. Confirm that all bubbles have been removed.
 6. Use a 50 cm³ (50 mL) syringe to rinse the recesses of the clamp pipe opening immersed in the sterilant solution. Confirm that all bubbles have been removed.
 7. Smooth the bristles of the tube cleaning brush and the tube opening cleaning brush by hand to remove all bubbles.
 8. Use a 50 cm³ (50 mL) syringe to thoroughly rinse the interior of the suction cleaning joint immersed in the sterilant solution to ensure that all bubbles have been removed.
 9. Cover the basin with a sealed lid to minimize the evaporation of the sterilant solution. Immerse all appliances as per the temperature and concentration recommended by the

sterilant manufacturer.

10. Remove the suction cleaning joint from the sterilant solution. Tilt the joint and drain the remaining sterilant solution inside the joint.
11. Remove all appliances from the sterilant solution.

□ Rinsing after high-level disinfection or sterilization

After high-level disinfection or sterilization, rinse all appliances according to the following procedures.

Use water with qualified microbiological quality. Once removed from disinfectant solution or sterilant solution, thoroughly rinse the appliances with sterile water to remove any remaining disinfectant solution or sterilant solution. If sterile water is not available, clean drinking water or water that has been treated (such as filtered) to improve the microbiological quality can be used in combination with 75%-95% ethanol or isopropanol for rinsing (please refer to the “Rinsing with non-sterile water and alcohol”). At the same time, please consult the relevant infection control department of your hospital.

Warning

- Alcohol is flammable. Safety must be given top priority when in use.

□ Rinsing with sterile water

1. Put sterile water in a small basin. The basin shall be deep enough to completely immerse all appliances.
2. Immerse all appliances in the sterile water.
3. Gently stir to thoroughly rinse the appliances.
4. Use a 50 cm³ (50 mL) syringe to rinse the interiors and recesses of all appliances immersed in the sterile water to ensure that all bubbles have been removed.
5. During immersion, press and release the pistons of the Air/Water Delivery button and Suction button. Confirm that all bubbles have been removed.
6. Smooth the bristles of the tube cleaning brush and the tube opening cleaning brush by

hand to remove all bubbles.

7. Install the 50 cm³ (50 mL) syringe on the suction cleaning joint and inject 50 cm³ (50 mL) of sterile water for syringes into the joint during immersion. Confirm that all bubbles have been removed.
8. Remove the suction cleaning joint from sterile water and tilt the joint. Drain the remaining sterile water on the joint.
9. Use a 50 cm³ (50 mL) syringe to deliver air into the suction cleaning joint to dry the interior of the joint.
10. Remove all appliances from the sterile water.
11. Thoroughly dry all outer surfaces with a sterile lint-free cloth.
12. Dry all appliances.
13. Store the components in accordance with the content of Chapter 9 “Storage and Handling of the Endoscope”.

Description

- Rinsing the interiors and recesses of the appliances with sterile water and then with 75%-95% ethanol or isopropanol will help the appliances dry.

□ Rinsing with non-sterile water and alcohol

1. Put clear water in a small basin. The basin shall be deep enough to completely immerse all appliances.
2. Carry out the Procedures 3 to 11 of “Rinsing with sterile water”, and immerse all appliances in the clear water.
3. Put 75%-95% ethanol or isopropanol in a small basin.
4. Immerse all appliances in the alcohol.
5. Gently stir all appliances in the alcohol.

6. Use a 50 cm³ (50 mL) syringe to inject alcohol into the interiors and recesses of all appliances to remove all bubbles.
7. During immersion, press and release the pistons of the Air/Water Delivery button and Suction button. Confirm that all bubbles have been removed.
8. Smooth the bristles of the tube cleaning brush and the tube opening cleaning brush by hand to remove all bubbles.
9. Install the 50 cm³ (50 mL) syringe on the suction cleaning joint and inject 50 cm³ (50 mL) of alcohol to rinse the joint and remove all bubbles.
10. Remove the suction cleaning joint from the alcohol, tilt the joint and discharge the remaining alcohol on the joint.
11. Use a 50 cm³ (50 mL) syringe to inject air into the suction cleaning joint for drying.
12. Remove all appliances from the alcohol.
13. Thoroughly dry all outer surfaces with a sterile lint-free cloth.
14. Dry all appliances.
15. Store the appliances in accordance with the content of Chapter 9 “Storage and Handling of the Endoscope”.

Chapter 8 Cleaning and Disinfection Equipment

This endoscope can be automatically cleaned, disinfected and sterilized using some of our recommended endoscope cleaning and disinfection machines. For details of operation, please refer to the user manual of the endoscope cleaning and disinfection machine.

Warning

- Before cleaning, disinfecting or sterilizing the endoscope, it shall be thoroughly cleaned in accordance with the instructions in Section 7.2 “Cleaning, Disinfection and Sterilization Procedures for Endoscopes”. If an endoscope that has not been thoroughly cleaned is placed in the endoscope cleaning and disinfection machine, debris attached to the endoscope may diminish the cleaning and disinfection or sterilization efficacy of the endoscope cleaning and disinfection machine, posing a risk of infection to the animal or operator performing the next examination. It should be noted that failure to pre-clean immediately after use can cause animal debris to coagulate and reduce the cleaning and disinfection effectiveness of the endoscope. For details on the connection of the endoscope to the endoscope cleaning and disinfection machine and the operation of the endoscope cleaning and disinfection machine, please refer to the user manual of the endoscope cleaning and disinfection machine.
- Our company only approves the endoscope cleaning and disinfection machine recommended by our company. If an endoscope cleaning and disinfection machine other than the one recommended by our company is used, it is the responsibility of the manufacturer of this endoscope cleaning and disinfection machine to confirm the compatibility of the endoscope models listed in its user manual.
- Before using an endoscope cleaning and disinfection machine, confirm that it is capable of cleaning, disinfecting and sterilizing the

endoscope and all of its channels. If it is uncertain whether the endoscope cleaning and disinfection machine is capable of cleaning, disinfecting and sterilizing the endoscope at a high level, including all channels, the manufacturer of the endoscope cleaning and disinfection machine shall be contacted to confirm its specific provisions or information on connectors. Otherwise, improper cleaning and disinfection or sterilization of the endoscope may cause a risk of infection to the next animal or operator using the endoscope.

- When cleaning and sterilizing the endoscope in an endoscope cleaning and disinfection machine, a connector compatible with the endoscope model shall be used. Otherwise, improper cleaning and disinfection or sterilization of the endoscope may cause a risk of infection to the animal or operator performing the next examination. Please contact us for information on the endoscope cleaning and disinfection machine applicable to this product.

Warning

- If an endoscope cleaning and disinfection machine is used, this endoscope cannot be cleaned, disinfected, or sterilized at the same time as other endoscopes. These endoscopes can only be cleaned, disinfected and sterilized one by one. Otherwise, improper cleaning or disinfection of the endoscope may cause a risk of infection to the next animal or operator using the endoscope.

Chapter 9 Storage and Handling of the Endoscope

Warning

- After cleaning, disinfection and sterilization, the clean endoscope and accessories shall be kept away from any contaminated equipment. Contaminating a clean endoscope and accessories between two examinations may cause a risk of infection to the next animal or operator using them.
- To prevent contamination of clean, disinfected and sterilized endoscope and accessories, make sure that the storage cabinet is clean.
- The storage cabinet must be clean, dry, well-ventilated, and kept at room temperature. Do not store the endoscope in a place with direct sunlight, high temperature, high humidity, or exposure to ozone, X-rays or ultraviolet rays. Otherwise, it may cause damage to the endoscope or cause a risk of infection.
- Do not store the endoscope in a transport case. The transport case can only be used to transport the endoscope. Routine storage of the endoscope in a humid, unventilated environment such as a transport case may cause a risk of infection.

9.1 Storage of the Endoscope

1. The endoscope shall be stored in an environment with a temperature ranging from 10°C to 40°C (50°F to 104°F) and a humidity ranging from 50% to 80%.
2. Remove all supporting components from the endoscope. For example: Suction button, Air/Water Delivery button, biopsy valve cap, waterproof cover, etc.
3. Confirm that all surfaces of the endoscope (especially the inside of the clamp pipe, tip, and

electrical connection points) are completely dry.

4. Carefully wipe the objective lens at the tip with a cotton swab dipped in 75%-95% alcohol.
5. Set the up/down and left/right angle locks of the endoscope to the unlocked position.
6. Hang the tip of the endoscope naturally down in the storage cabinet. Make sure that the insertion section hangs vertically and should be as straight as possible.

9.2 Storage of Reusable Components, Cleaning, Disinfection and Sterilization Equipment, and Leak Detector

1. Make sure that all reusable components and cleaning, disinfection and sterilization equipment are completely dry.
2. Store all reusable components in a storage cabinet. Confirm that these components do not come in contact with each other during storage.
3. Store all cleaning, disinfection and sterilization equipment in a container, and then place the container in a storage cabinet.

□ Disposal

All applicable national and local laws and regulations shall be followed when discarding this endoscope and any components (e.g., buttons).

9.3 Handling in the Hospital

When handling the endoscope by hand, the general-purpose cable shall be coiled up. Pick up the operation section and the light guide plug with one hand, and carefully hold the front end of the insertion section with the other hand, but do not apply excessive force or squeeze.

9.4 Handling Outside the Hospital

The endoscope shall be placed in the transport case for handling.

Warning

- The endoscope must be cleaned, disinfected or sterilized after removal from the transport case. Failure to clean, disinfect or sterilize the endoscope may result in infection.

Caution

- The transport case must not be cleaned, disinfected or sterilized. The endoscope must be cleaned, disinfected or sterilized before it is loaded.
- When handling the endoscope, do not cover it with a waterproof cover to prevent damage to the endoscope due to changes in air pressure during handling.

□ Disposal

All applicable national and local laws and regulations shall be followed when handling the endoscope and any of its components (e.g., Suction button, Air/Water Delivery button, etc.).

Warning

- After the endoscope and its components have been disinfected or sterilized using disinfectants or sterilants recommended by the Company, bulk waste chemical reagents, waste disinfectants, and other waste liquids generated after use shall be disposed of by specialized agencies.

Dispose of the endoscope and its accessories at the end of the service life according to the regulations. It is strictly forbidden to treat the instrument as domestic waste to avoid environmental contamination.

Chapter 10 Troubleshooting

If the endoscope is damaged, degraded or otherwise abnormal after check as described in Chapter 3 “Preparation and Check”, do not use the endoscope and please contact us.

Some non-functional failures can be resolved with the contents of Section 10.1 “Troubleshooting Guide”. If there are still failures that cannot be eliminated, please stop using the endoscope and contact us.

Our company is not responsible for repairing accessories. If the accessories are damaged, please contact us to purchase new ones.

Warning

- Do not use the endoscope on animals if you suspect abnormalities in the endoscope. Damage to the equipment or other abnormalities may endanger the life of the animal and the operator, and cause more serious equipment damage.
- If endoscope components fall into the animal due to equipment damage or malfunction, stop using the endoscope immediately, and properly remove the components that have fallen into the animal.

If there is any abnormality in the function or image of the endoscope during use, stop using the endoscope immediately, and carefully withdraw the endoscope from the animal as described in Section 10.2 “Withdrawing an Abnormal Endoscope”.

10.1 Troubleshooting Guide

The following tables show the failures and countermeasures caused by incorrect settings or damaged consumables.

The failures other than the following causes shall be repaired. Repair by maintenance personnel not authorized by our company may cause injury to the animal or user. Therefore, be sure to contact us for repairs as specified in Section 10.3 “Repair of the Endoscope”.

□ Functions of endoscope

Bending angle

Fault	Possible cause	Solutions
The angle control knob is blocked when rotating	The angle lock is stuck	Rotate the angle lock in the “F ▶” direction

Air/water delivery

Fault	Possible cause	Solutions
Unable to deliver air	The air pump is not started	According to the content of the portable air pump’s user manual, press the air pump switch and adjust the air pump’s level
	The Air/Water Delivery button is damaged	Replace the Air/Water Delivery button
Unable to deliver water	The air pump is not started	According to the content of the portable air pump’s user manual, press the air pump switch and adjust the air pump’s level
	There is no sterile water in the water bottle	Add sterile water to the water bottle to the specified water level
	The Air/Water Delivery button is damaged	Replace the Air/Water Delivery button
The Air/Water Delivery button feels stiff	The Water/Air Delivery button is contaminated	Remove the Air/Water Delivery button, clean it and reinstall it
	The Air/Water Delivery button is damaged	Replace the Air/Water Delivery button
The Air/Water Delivery button cannot be installed	Use the wrong Air/Water Delivery button	Use the proper Air/Water Delivery button
	The Air/Water Delivery button is damaged	Replace the Air/Water Delivery button

Suction

Fault	Possible cause	Solutions
Suction is unavailable or suction is insufficient	The biopsy valve cap is not installed properly	Install the biopsy valve cap properly

	The biopsy valve cap is damaged	Replace with a new biopsy valve cap
	Improper suction pump settings	Adjust the settings according to the suction pump manual
	The Suction button is damaged	Replace with a new button
The Suction button feels astringent	The Suction button is contaminated	Remove the Suction button, clean it and reinstall it
	The Suction button is damaged	Replace with a new Suction button
The Suction button cannot be installed	The Suction button is damaged	Replace with a new Suction button
	Use the wrong Suction button	Use the proper Suction button
The clamp pipe opening leaks water	The biopsy valve cap is damaged	Replace with a new biopsy valve cap
	The biopsy valve cap is not installed properly	Install the biopsy valve cap properly

Image quality or brightness

Fault	Possible cause	Solutions
No image display	The power is not turned on	Turn on all power switches
The image is not clear	The objective lens are contaminated	Deliver water to the objective lens and clean the mucus, etc.
Abnormal image	The image processing unit used is not compatible	Select a supporting image processing unit





Endoscopic diagnostic and therapeutic accessories

Fault	Possible cause	Solutions
The accessories are not inserted smoothly through the clamp pipe	The accessories used are not compatible	Refer to the user manual of each accessory and select the matching one

Others

Fault	Possible cause	Solutions
Button malfunction	The wrong button is used	Use the button corresponding to the desired function
	The button is not set properly	Set the button function properly according to the user manual of the image processing unit

Error messages

Fault	Possible cause	Solutions
<p>The battery power displays the following identification:</p> 	<p>Battery exhaustion</p>	<p>Charge the battery</p>
<p>The upper left corner of the image processor displays the following identification:</p> 	<p>SD card abnormality</p>	<p>Reinstall the SD card</p>
<p>The upper left corner of the image processor displays the following identification:</p> 	<p>SD card abnormality</p>	<p>Reinstall the SD card</p>
<p>The white balance identification of the image processor does not fade after it appears:</p> 	<p>The white balance cannot be locked</p>	<p>Restart the veterinary endoscopic image processor</p>
<p>The power light does not come on</p>	<p>The adapter is not powered on or the plug has poor contact</p>	<p>Check whether the socket is powered on and recheck the</p>

after connecting the adapter		plug contact
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Table 9.6

10.2 Withdrawing an Abnormal Endoscope

If the endoscope malfunctions, take appropriate measures in accordance with the instructions below: “when an endoscopic image is displayed on the monitor” or “when there is no endoscopic image displayed on the monitor or the frozen image cannot be restored”. After withdrawal, return the endoscope for repair as described in Section 10.3 “Repair of the Endoscope”.

Warning

- If the endoscope or accessories cannot be extracted smoothly from the animal, do not try to withdraw it by force, but handle it properly. If any abnormality is found, please contact us immediately. Forcibly withdrawing the endoscope or accessories may result in injury, hemorrhage or perforation of the animals.

□ When an endoscopic image is displayed on the monitor

1. Turn off all equipment except the image processing device, portable air pump and monitor.
2. Disable the function when using the image magnification function of the image processing unit.
3. If the endoscopic diagnostic and therapeutic accessories are used, close or retract the accessory tip into the sheath tube. Then slowly withdraw the accessories.
4. Press the Suction button to suck excess air, blood, mucus or other debris.
5. Rotate the up/down and left/right angle locks in the “F ▶” direction for release.
6. Carefully withdraw the endoscope while observing the endoscopic image.
7. Remove the mouth guard from the animal’s mouth.

□ When magnification is unavailable

1. Turn off all equipment except the image processing device, portable air pump and monitor.
2. When the image processing unit cannot enlarge the image, turn off the image processing

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unit and then turn it back on. If magnification is still unavailable, turn off the image processing unit and proceed to Procedure 2 and subsequent operations in “when an endoscopic image is displayed on the monitor” in Section 10.2.

3. Turn off all equipment except the image processing device, portable air pump and monitor.
4. If the endoscopic diagnostic and therapeutic accessories are used, close or retract the accessory tip into the sheath tube. Then slowly withdraw the accessories.
5. Rotate the up/down and left/right angle locks in the “F ►” direction to release the lock.
6. Restore the up/down and left/right angle control knobs to their natural positions (as shown in Figure 3.4). Release the angle control knob and then carefully withdraw the endoscope.
7. Remove the mouth guard from the animal’s mouth.

10.3 Repair of the Endoscope

Warning

- Before repairing the endoscope, please clean it thoroughly and disinfect or sterilize it at a high level. Improper cleaning, disinfection and sterilization may cause a risk of infection to personnel of hospitals and the Company who handling the equipment.

Please contact us before repair of the endoscope. During repair, please attach a description of the failure or damage of the endoscope, the name and contact number of the person most familiar with the failure of this endoscope, and please also attach Warranty Card.

If the endoscope is to be repaired, please handle the endoscope as described in Section 9.4 “Handling Outside the Hospital”.

Please ship for repair to:

Endoscopy Support Services, Inc.
ATN: Service Department
3 Fallsview Lane
Brewster, NY 10509

Get a "Speed Up" Repair Form online: endoscopy.com/repair



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