

# **SA Series Veterinary Endoscope**

## **User Manual**

SAPro-W (Display Version) / SA-W (Wireless Version)



### **Notes**

Please read the user manual before operating this device.

## **Important Notice**

This manual is prepared for the SA Series veterinary endoscopes (SA-Pro and SA-Air). Featuring HD imaging, a 3-second probe change capability, and multi-probe compatibility, it is designed for minimally invasive examination of the digestive and respiratory tracts in dogs, cats, cattle, horses, and other animals. As the official guide for both models, this document does not constitute a commitment to specific hardware or software configurations. Copyright ©Coantec Automation Technology Co.Ltd (Coantec Ltd.). All rights reserved; no reproduction or translation without permission. As we continue to innovate and enhance our products and services, we reserve the right to update hardware, software, or content without prior notice. For any inquiries, please contact our after-sales service team. Tel: +8675589728626

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# **1. User Instructions**

## **1.1. Intended Use and Scope**

This product is specifically designed for veterinary clinical applications, including minimally invasive examination and treatment of the digestive and respiratory tracts in dogs, cats, cattle, horses, and other animals. It enables veterinarians to perform precise, non-traumatic and therapeutic procedures. The device supports real-time image viewing, photography, video recording, image comparison, and optional measurement functions, significantly reducing equipment procurement and maintenance costs.

## **1.2. Repair and Modification Notice**

This product contains no user-serviceable parts. Do not attempt to disassemble, modify, or repair the device. The manufacturer assumes no liability for any injury or loss resulting from such actions. Repair services are provided exclusively by the manufacturer and its authorized distributors.

## **1.3. Safety Precautions**

When using this product, observe the following precautions to prevent accidental injury or equipment damage:

- ① Prohibited for human medical examination.
- ② Do not operate on live equipment to avoid electric shock.
- ③ Do not stare directly into the LED light at the probe tip at close range to avoid vision impairment.
- ④ Do not excessively bend, stretch, twist, or crush the probe cable.
- ⑤ If the lens becomes dirty, it may blur the image. Before use, wipe it clean with a lint-free cloth moistened with a small amount of alcohol.
- ⑥ Clean the device promptly after use.
- ⑦ Before power-on, ensure the insertion tube is straight. Do not perform articulation while the tube is coiled.

⑧ During operation, operate the joystick slowly to control probe articulation. Do not keep the probe at the maximum bending angle for extended periods, as this may reduce service life.

⑨ If any abnormality occurs, stop observation immediately and return the probe to the neutral position. Then carefully withdraw the insertion tube, power off the device, and contact the manufacturer or distributor promptly.

## 2. Quick Start

### 2.1. Standard Accessories List

After opening the package, please carefully check all accessories against the list below to ensure completeness and integrity. If any item is missing or damaged, please contact after-sales service or your distributor promptly.



- ① Instrument case (standard)
- ② SAPro-W main unit (standard)
- ③ Magnetic base (standard)
- ④ SA-W main unit (standard)

- ⑧ Cytology brush (optional)
- ⑨ Double-ended brush (optional)
- ⑩ Insufflation bulb (standard)
- ⑪ Charger & data cable (standard)

- ⑤ Interchangeable tube (standard)
- ⑥ Basket forceps (optional)
- ⑦ Biopsy forceps (optional)
- ⑫ Luer connector (standard)
- ⑬ Three-way stopcock (standard)
- ⑭ Y-connector (standard)
- ⑮ Syringe (standard)

**【Figure 1 SA Series Component Overview】**

| Standard Configuration                                                                            | Quantity             |
|---------------------------------------------------------------------------------------------------|----------------------|
| Main unit (SAPro-W or SA-W)                                                                       | 1                    |
| Dedicated instrument case                                                                         | 1                    |
| Rechargeable lithium battery (3.7V/5000mAh)                                                       | 1                    |
| Charger                                                                                           | 1                    |
| User manual                                                                                       | 1                    |
| Card reader, 8GB TF memory card                                                                   | 1                    |
| Basic accessory kit (Y-connector, three-way stopcock, syringe, Luer connector, insufflation bulb) | 1                    |
| Magnetic base                                                                                     | 1                    |
| Interchangeable tube (customizable, available in selectable specifications)                       | Configured per order |
| Mini HDMI cable (supports external display up to 800×480 resolution)                              | Optional             |
| Accessory kit (cytology brush, double-ended brush, basket forceps, biopsy forceps)                | Optional             |

## 2.2. Quick Start Guide

| Step                                        | Operation                                                                                              | SAPro-W<br>(Display Version) | SA-W<br>(Wireless Version) |
|---------------------------------------------|--------------------------------------------------------------------------------------------------------|------------------------------|----------------------------|
| ①<br><b>Unboxing<br/>and<br/>inspection</b> | Check the main unit, insertion tube, charger, and all accessories against the accessory list to verify | Applies to both models.      | Applies to both models.    |

|                                       |                                                                                                                                                              |                                                                                                                  |                                                                                                            |
|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
|                                       | completeness and condition.                                                                                                                                  |                                                                                                                  |                                                                                                            |
| ②<br><b>Insertion tube connection</b> | Align the Type-C connector of the Insertion tube with the handle interface, push it in straight, and turn the locking ring clockwise until a click is heard. | Applies to both models (see Section 3.1 for details).                                                            | Applies to both models (see Section 3.1 for details).                                                      |
| ③<br><b>Accessory connection</b>      | Connect the Y-connector, insufflation bulb, syringe, or surgical instruments to the instrument channel as required.                                          | Applies to both models (see Section 3.1 for details).                                                            | Applies to both models (see Section 3.1 for details).                                                      |
| ④<br><b>Power-on and display</b>      | Press and hold the power button for 3 seconds to power on.                                                                                                   | The built-in 5-inch screen displays the image directly; an external monitor can also be connected via Mini HDMI. | Connect to a smartphone or tablet via Wi-Fi or Type-C, then launch the dedicated app to receive the image. |
| ⑤<br><b>Function operations</b>       | Capture, record, freeze, brightness adjustment, etc.                                                                                                         | Physical buttons on the handle + menu system.                                                                    | Frequent operations via physical buttons; advanced functions via the app.                                  |
| ⑥<br><b>Power-off and storage</b>     | Press and hold the power button to power off. Disconnect the insertion tube and accessories, clean and disinfect, then place the unit back into the          | Applies to both models.                                                                                          | Applies to both models.                                                                                    |

|  |                  |  |  |
|--|------------------|--|--|
|  | instrument case. |  |  |
|--|------------------|--|--|

### 3. Detailed Operating Instructions

#### 3.1. Connecting the Probe and Functional Accessories

Proper connection of the probe and accessories is fundamental to ensuring normal device operation and procedural safety. The probe connection method is identical for both SA Series models; please strictly adhere to the following operating guidelines.

##### 3.1.1. Connecting/Replacing the Insertion Tube on the Handle

###### Connection steps:

- ① Align the alignment mark on the Type-C connector of the insertion tube with the alignment mark on the handle interface.
- ② Push the connector straight in along the axis.
- ③ Turn the locking ring clockwise until a slight click is heard, confirming secure locking.
- ④ Gently pull the insertion tube to ensure it is firmly connected.

###### Disconnection steps:

- ① Hold the handle with one hand and turn the locking ring counterclockwise with the other hand until a click is heard to unlock it.
- ② Pull the connector out straight.





【Figure 2: Connecting/Replacing the Insertion Tube】

### 3.1.2. Connecting and Operating Functional Accessories

The SA Series is a portable model with a front-facing camera. The Y-connector serves as the central hub that integrates insufflation, irrigation, and aspiration functions, all operated independently via manual attachments.

#### 1) Connecting the push-fit Y-connector

Firmly press the straight port of the Y-connector into the instrument channel port on the probe handle, then tighten it to ensure an airtight and watertight seal. When using the air/water channel, withdraw the instrument and lift the corresponding Y-connector cap. (See Figure 3)



【Figure 3: Y-connector Connection】

## 2) Function 1: Grasping

**Connecting the biopsy forceps:** Insert the biopsy forceps into the large straight port of the Y-connector to enable grasping. (See Figure 4)



【Figure 4: Biopsy Forceps Connection】

## 3) Function 2: Irrigation and Aspiration

① **Install the three-way stopcock:** Insert the three-way stopcock into the other port of the Y-connector and tighten it. (See Figure 5)

② **Connect the syringe:** Attach a syringe pre-filled with sterile saline to the remaining port of the three-way stopcock. Close the valve to the insufflation bulb port, opening only the passage between the syringe and the endoscope channel. (See Figures 6&7)

③ **Irrigation/aspiration:** Push the syringe plunger forward to irrigate the target area with fluid; pull it back to aspirate fluid, secretions, or small tissue fragments from the lumen. (See Figure 8)



【Figure 5: Three-Way Stopcock Connection】



【Figures 6&7: Syringe Connection】



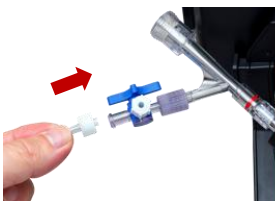
【Figure 8: Irrigation/Aspiration Diagram】



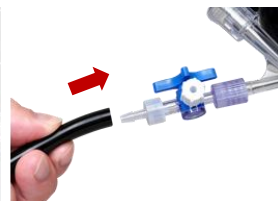
#### 4) Function 3: Insufflation

① **Install the Luer connector:** Connect the Luer connector to the remaining port of the three-way stopcock and tighten it. (See Figures 9&10)

② **Connect the insufflation bulb:** Attach the insufflation bulb to one port of the Luer connector, close the valve on the other side, and manually squeeze the bulb to insufflate air into the lumen for temporary distension during endoscopic examination. (See Figure 11)



【Figures 9&10: Luer Connector Installation】

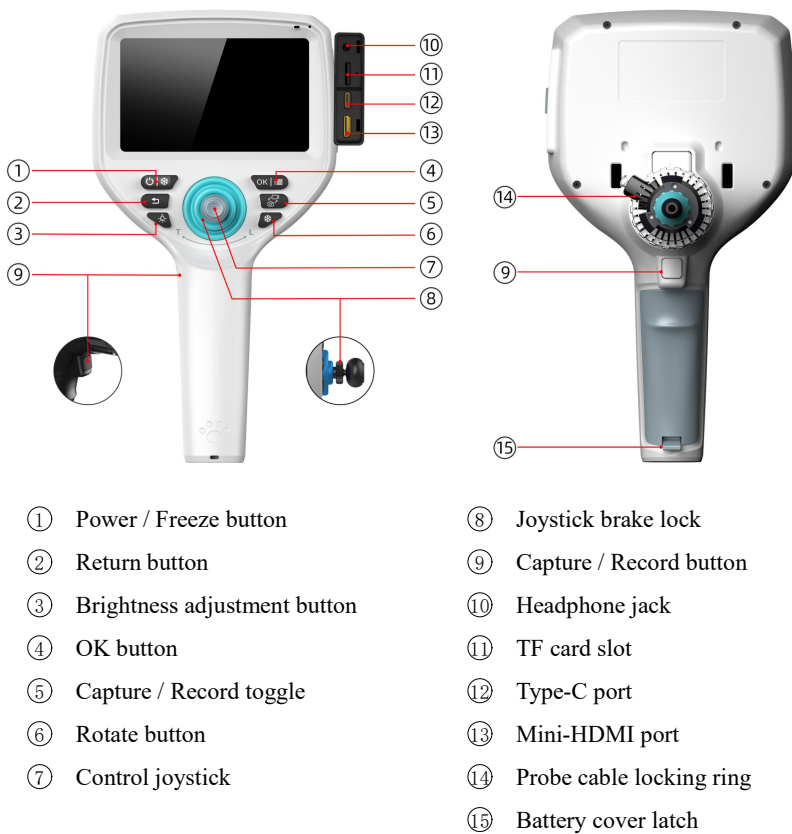


【Figure 11: Insufflation Bulb Connection】

### 3.2. Main Unit Functions and Operating Instructions

While the SAPro-W and SA-W share the same core operating logic, each model incorporates exclusive design features in functionality and operation. This chapter provides the official operating instructions for each model separately.

### 3.2.1. SAPro-W (Display Version) Operating Instructions



**【Figure 12: SAPro-W Handle Button Layout】**

## 1) Button Function Description

| Button / Interface             | Function Description                                                                                                                                                                                                                                                                                       |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ① Power / Freeze button        | <ul style="list-style-type: none"> <li>● <b>Long press (3 seconds):</b> power on/off.</li> <li>● <b>Short press:</b> freeze the live image for detailed inspection; press again to resume real-time preview.</li> </ul>                                                                                    |
| ② Return button                | Short press to return to the previous level when the current interface is a function menu.                                                                                                                                                                                                                 |
| ③ Brightness adjustment button | Front LED brightness adjustment across 0–3 levels.                                                                                                                                                                                                                                                         |
| ④ OK button                    | Short press to confirm.                                                                                                                                                                                                                                                                                    |
| ⑤ Capture / Record toggle      | Short press to toggle between photo and video modes; the on-screen icon indicates the current mode.                                                                                                                                                                                                        |
| ⑥ Rotate button                | Short press to rotate the live inspection image 90° clockwise per press.                                                                                                                                                                                                                                   |
| ⑦ Control joystick             | 360° omnidirectional mechanical articulation ensures flexible steering and precise positioning.                                                                                                                                                                                                            |
| ⑧ Joystick brake lock          | Engaging the joystick lock secures the probe, preventing inadvertent movement and image displacement caused by accidental joystick contact during inspection.                                                                                                                                              |
| ⑨ Capture / Record button      | <ul style="list-style-type: none"> <li>● Located on the rear of the handle for quick capture during handheld use.</li> <li>● In photo mode, short press to capture.</li> <li>● In video mode, short press to start/stop recording; during recording, long press (3 s) to capture a still image.</li> </ul> |
| ⑩ Headphone jack               | Connects to headphones for audio output.                                                                                                                                                                                                                                                                   |
| ⑪ TF card slot                 | Supports optional 8GB TF card, expandable up to 32GB for image and video storage.                                                                                                                                                                                                                          |
| ⑫ Type-C port                  | Supports device charging, firmware upgrades, and image/video data transfer.                                                                                                                                                                                                                                |

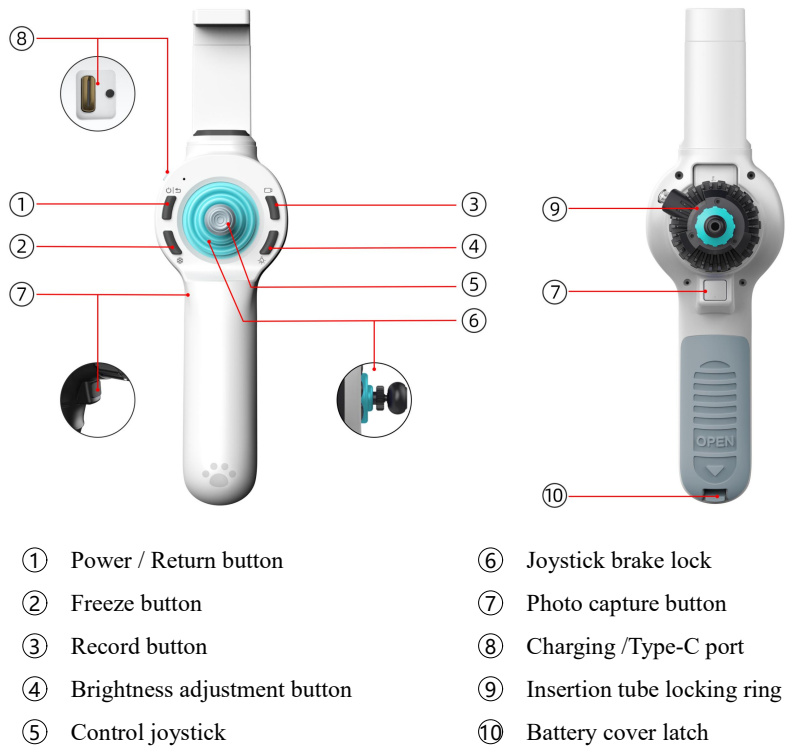
|                                      |                                                                                                                                                         |
|--------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| ⑬ <b>Mini-HDMI port</b>              | Supports connection to an external HDMI monitor (800×480) for real-time display on an external monitor, suitable for teaching and client communication. |
| ⑭ <b>Insertion tube locking ring</b> | Insertion tube installation and removal.                                                                                                                |
| ⑮ <b>Battery cover latch</b>         | Battery installation and removal.                                                                                                                       |

## 2) Touchscreen Operating Instructions

The device's touchscreen enables full-function operation. The functions of each module are described below:

- **System settings:** screen brightness, auto power-off timer, date/time, languages (Simplified Chinese, Traditional Chinese, English, Japanese, Korean, French, German, and 10+ more), hospital information (name/address/phone), image parameters (contrast/saturation/white balance/color mode), network IP, and software version (supports TF card and USB system upgrades).
- **Pre-procedure information presets:** Pre-enter clinician details (name/ID) and patient information (pet name/owner name/phone/address/visit ID/examination site) to streamline report generation and minimize data entry errors.
- **Intra-procedure functions:** The real-time touchscreen image supports brightness adjustment, freeze, capture/record toggle, and more. Pinch-to-zoom enables up to 5× partial magnification for clear visualisation of lesion details.
- **File management:** Supports category-based browsing of images, videos, and reports; image preview, video playback, file deletion, and report generation.
- **Report and sharing:** Select diagnostic images, mark key frames, add diagnostic recommendations, and generate a report with one tap. Reports can be quickly accessed by scanning a LAN QR code.

### 3.2.2. SA-W (Wireless Version) Operating Instructions



**【Figure 13: SA-W Handle Button Layout】**

#### 1) Button Function Description

| Button / Interface      | Function Description                                                                                                                                                                                                                                              |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ① Power / Return button | <ul style="list-style-type: none"> <li>● Long press (3 seconds): power on/off.</li> <li>● When connected to an external device, short press to wake the device from standby.</li> <li>● When in a function menu, short press to return to the previous</li> </ul> |

|                                |                                                                                                                                                               |
|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                | level.                                                                                                                                                        |
| ② Freeze button                | Short press to freeze the current image for detailed inspection of lesions; short press again to unfreeze and resume live preview.                            |
| ③ Record button                | Short press to start/stop recording.                                                                                                                          |
| ④ Brightness adjustment button | Front LED brightness adjustment across 0–3 levels.                                                                                                            |
| ⑤ Control joystick             | 360° omnidirectional mechanical articulation ensures flexible steering and precise positioning.                                                               |
| ⑥ Joystick brake lock          | Engaging the joystick lock secures the probe, preventing inadvertent movement and image displacement caused by accidental joystick contact during inspection. |
| ⑦ Photo capture button         | Short press to capture photos; located on the rear of the handle for convenient handheld operation.                                                           |
| ⑧ Charging /Type-C port        | Supports charging, wired connection to external smart devices, data transfer, and firmware upgrades.                                                          |
| ⑨ Insertion tube locking ring  | Insertion tube installation and removal.                                                                                                                      |
| ⑩ Battery cover latch          | Battery installation and removal.                                                                                                                             |

## 2) Dedicated App Operating Instructions

The full functionality of the SA-W requires the dedicated app. Before first use, please download and install the latest version as directed.

- **Basic functions:** Real-time HD preview, video recording, image freeze, and 0–3 level brightness adjustment.
- **Advanced functions:** Image parameter settings (white balance, colour, contrast), 5× partial zoom, case management, one-tap report generation, and image/video sharing.
- **System functions:** Managing files on the connected device. Device firmware upgrades, language settings, and storage management.

## 4. Technical Specifications & Maintenance Guidelines

### 4.1. Official Technical Specifications

#### 4.1.1. Main Unit System General Parameters

| Specification    | SAPro-W<br>(Display Version)                                                                   | SA-W<br>(Wireless Version)                       |
|------------------|------------------------------------------------------------------------------------------------|--------------------------------------------------|
| Display          | 5-inch HD touchscreen (800×480)                                                                | None; image via external device                  |
| Operation        | Main unit with screen + physical buttons                                                       | App + physical buttons                           |
| Image Zoom       | Supports 5× partial zoom                                                                       | Supports 5× partial zoom                         |
| LED Brightness   | 0–3 adjustable levels                                                                          | 0–3 adjustable levels                            |
| Image Operations | Capture, record, freeze                                                                        | Capture, record, freeze                          |
| File Format      | Image: JPEG/BMP; Video: MP4                                                                    | Image: JPEG/BMP; Video: MP4                      |
| Storage          | Optional 8GB TF card, expandable up to 32GB                                                    | Mobile phone storage via Wi-Fi connection        |
| Languages        | 10+ (Simplified/Traditional Chinese, English, Japanese, Korean, French, German, Russian, etc.) | Multi-language synchronized with external app    |
| Output Interface | Mini HDMI, Type-C                                                                              | Type-C                                           |
| Wireless         | Not supported                                                                                  | Wi-Fi & wired connection to phone/tablet/monitor |
| Firmware Upgrade | TF card, USB                                                                                   | —                                                |

|                                        |                      |                      |
|----------------------------------------|----------------------|----------------------|
| <b>Main Unit Dimensions</b>            | 260mm × 140mm × 88mm | 140mm × 259mm × 84mm |
| <b>Main Unit Weight (with battery)</b> | 0.5kg                | 0.45kg               |

#### 4.1.2. Probe System Official Specifications

| Specification                         | Details                                                                                  |
|---------------------------------------|------------------------------------------------------------------------------------------|
| <b>Probe Diameter</b>                 | φ3.9mm (0.16M / 0.5M pixels), φ6mm (1M pixel), φ8mm (1M pixel); custom options available |
| <b>Field of View</b>                  | φ3.9mm: 120°; φ6mm: 140°; 8mm: 140°                                                      |
| <b>Depth of Field</b>                 | 3–50mm                                                                                   |
| <b>Illumination</b>                   | Front LED                                                                                |
| <b>Articulation Control</b>           | 360° all-direction mechanical steering with joystick control                             |
| <b>Bending Angle</b>                  | 180°–210°                                                                                |
| <b>Insertion Tube Material</b>        | Medical-grade polyurethane tube – flexible, kink-resistant, and abrasion-resistant       |
| <b>Standard Insertion Tube Length</b> | 1m                                                                                       |
| <b>Connection</b>                     | Type-C, replaceable within 3 seconds                                                     |
| <b>Probe IP Rating</b>                | IP67 (dust-tight and waterproof; supports immersion disinfection)                        |
| <b>Main Unit IP Rating</b>            | IP54                                                                                     |

### 4.1.3. Electrical and Power Official Specifications

| Specification                | Details                                                |
|------------------------------|--------------------------------------------------------|
| <b>Battery Type</b>          | Rechargeable lithium battery (3.7V/5000mAh, removable) |
| <b>Continuous Runtime</b>    | 4 hours                                                |
| <b>Charging Time</b>         | ≤ 2.5 hours                                            |
| <b>Battery Protection</b>    | Built-in short-circuit protection                      |
| <b>Charging Interface</b>    | Type-C                                                 |
| <b>Operating Temperature</b> | Main unit: -10°C to 50°C; Probe: -20°C to 60°C         |
| <b>Storage Temperature</b>   | -20°C to 60°C                                          |
| <b>Relative Humidity</b>     | 15%–90%                                                |
| <b>Drop Test</b>             | Complies with GB/T 2423.8- 1995                        |

## 4.2. Cleaning, Disinfection, and Maintenance

This chapter follows the SA Veterinary Electronic Endoscope Disinfection Guidelines and serves as the official disinfection and maintenance protocol. Damage caused by non-compliance is not covered under warranty.

**Core principles:** Clean before disinfection. Disinfect after each use and between animals. Do not immerse the main unit or battery. Only the distal insertion tube (shaft) of the probe cable can be disinfected by immersion. Do not immerse the cable body.

### 4.2.1. Component Disinfection Compatibility Quick Reference

| Component                             | Authorized Disinfection Methods                                                                                                                 | Strictly Prohibited Actions                                                                                           |
|---------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| <b>Insertion tube (lens / tubing)</b> |  0.55% ortho-phthalaldehyde (OPA) soak for 5 min (preferred) |  Immersing the cable connector end |
|                                       |  2% glutaraldehyde soak for 10-15 min                        |  Autoclaving / steam sterilization |

|                                                              |                                                                                        |                                                                                                                                                                                             |
|--------------------------------------------------------------|----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                              |                                                                                        | <p>✗ Soaking in alcohol / chlorine-based disinfectants</p> <p>✗ Boiling</p> <p>✗ Continuous soaking &gt;30 min</p> <p>✗ Cleaning the channel with wire brushes / stiff-bristled brushes</p> |
| <b>Handle (battery removed)</b>                              | <p>✓ 75% medical alcohol wipe</p> <p>✓ Medical disinfectant wipe</p>                   | <p>✗ Any form of immersion or rinsing</p>                                                                                                                                                   |
| <b>Main unit, battery, charger</b>                           | <p>✓ 75% medical alcohol wipe</p> <p>✓ Medical disinfectant wipe</p>                   | <p>✗ Immersion or rinsing</p> <p>✗ Direct UV exposure to screen</p> <p>✗ Storage in high-temperature environments</p>                                                                       |
| <b>Accessory surgical instruments (e.g., biopsy forceps)</b> | <p>✓ Autoclaving / steam sterilization (preferred)</p> <p>✓ 2% glutaraldehyde soak</p> | <p>✗ Soaking in alcohol</p>                                                                                                                                                                 |

#### 4.2.2. Invasive Procedure Disinfection Protocol (Mandatory)

- 1) **Pre-cleaning (immediately after procedure):** Power off the device and remove the battery from the handle. Wipe the insertion tube surface with a damp non-woven cloth. Flush the instrument channel with a large-volume syringe to remove residual tissue and body fluids.
- 2) **Enzymatic cleaning (do not skip):** Immerse the insertion tube (excluding the connector end) in a 1:200 dilution of multi-enzyme cleaning solution (30–40°C) for 5 minutes. Brush the instrument channel thoroughly at least 5 times with a dedicated cleaning brush.
- 3) **Rinsing:** Thoroughly rinse the outer surface of the insertion tube and the instrument channel with sterile water until the effluent is clear and free of foam.

- 4) **Disinfection:** Fully immerse the insertion tube in 2% glutaraldehyde solution. Use a syringe to fill the instrument channel with disinfectant, ensuring no air bubbles remain. Soak for 10 minutes for routine cases; extend to 15 minutes for cases involving infectious animal diseases.
- 5) **Final rinse and drying:** Thoroughly rinse the outer surface and instrument channel with sterile water to remove all disinfectant residues. Use a sterile syringe to repeatedly flush and blow-dry the channel. Hang vertically in a well-ventilated area to air-dry completely before storage.

#### **4.2.3. Storage and Maintenance Guidelines**

- 1) Store the device in a clean, dry, light-proof, and well-ventilated environment with a temperature range of 10~40°C and relative humidity of 30%–80%. Keep away from corrosive gases and high-temperature environments.
- 2) The insertion tube must be hung vertically or laid flat in the dedicated instrument case. Do not bend, squeeze, or place heavy objects on it.
- 3) When not in use for extended periods, store the battery at approximately 50% charge. Perform a full charge/discharge cycle every 2~3 months to maintain battery health.
- 4) Before each use, inspect the insertion tube, lens, and seals for any signs of damage. Power on the device and verify that imaging, articulation, and button functions are normal. Do not use the device for clinical procedures if any abnormality is detected.

#### 4.2.4. Battery Installation and Removal

**Notes:** Install the battery with correct polarity. Use only the supplied battery. Always power off before removal; do not remove the battery while the device is on.



**【Figure 14: Battery Installation】**



**【Figure 15: Battery Removal】**

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