

Vetina ES3

Veterinary Flexible Endoscope Image System

Operator's Manual

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IMPORTANT!

The system is for veterinary use only.

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- Malfunction or damage caused by improper operation or repair by unqualified or unauthorized service people.
- Malfunction of the instrument or part whose serial number is not legible enough.
- Others not caused by instrument or part itself.

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Preface

Manual Purpose

This manual contains the instructions necessary to operate the product safely and in accordance with its function and intended use. Observance of this manual is a prerequisite for proper product performance and correct operation and ensures patient and operator safety.

This manual is based on the maximum configuration and therefore some contents may not apply to your product. If you have any question, please contact us.

This manual is an integral part of the product. It should always be kept close to the equipment so that it can be obtained conveniently when needed.

Intended Audience

This manual is geared for clinical professionals who are expected to have a working knowledge of medical procedures, practices and terminology as required for monitoring of critically ill patients.

Illustrations

All illustrations in this manual serve as examples only. They may not necessarily reflect the setup or data displayed on your equipment.

Conventions

- ***Italic text*** is used in this manual to quote the referenced chapters or sections.
- **Bold text** is used to indicate the screen texts.
- → is used to indicate operational procedures.

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1 Safety

1.1 Safety Information



WARNING

- Indicates a potential hazard or unsafe practice that, if not avoided, could result in death or serious injury to the affected animal or property damage.
-



CAUTION

- Indicates a potential hazard or unsafe practice that, if not avoided, could result in minor injury to the affected animal or product/property damage.
-

NOTE

- Provides application tips or other useful information to ensure that you get the most from your product.
-

1.1.1 Warnings



WARNING

- **To prevent electric shock, do not remove the screws and the enclosure without permission. No parts in the part can be repaired or adjusted by users. Ask professionals to repair them or contact Mindray Animal Medical.**
 - **Protect the product from being affected by rain and dampness; otherwise, a fire or electric shock would be caused.**
 - **Do not check or use the product with wet hands. It is strictly forbidden to use the product in an environment with a flammable anesthetic gas mixed with air or oxygen or nitrous oxide; otherwise, an explosion or fire would take place.**
 - **Do not look directly at the output hole of the light source; otherwise, your eyes would be injured by strong light.**
 - **Only professional maintenance personnel can open the chassis; otherwise, an electric shock would be caused.**
 - **When the product is used with auxiliary equipment, an insulating transformer or insulating socket must be used for the non-medical auxiliary equipment to ensure the safe use of electricity.**
 - **Be sure to cut off the power supply before replacing the fuse for the product.**
 - **Protect the product from being affected by rain and dampness; otherwise, a fire or electric shock would be caused.**
-

1.1.2 Cautions



CAUTION

- **Protect the product from violent vibration, and handle it with care when moving.**
 - **To use the display screen, gently lift the protective film from both sides, avoiding damage to the screen by excessive force. Turn the display screen to a limited angle. Do not press it hard.**
-

1.1.3 Notes

NOTE

- **Please read through this Operator's Manual carefully before using the product, and keep it properly with the product for future reference. If this Operator's Manual is lost or damaged, contact Mindray Animal Medical to get a new one in a timely manner.**
 - **If you have any questions about the information provided in the Operator's Manual of Mindray Animal Medical or the operation and safety of the endoscope, contact Mindray Animal Medical or its authorized service agent nearby.**
 - **Mindray Animal Medical provides a list of default accessories and spare parts for the instrument. After receiving the goods, check the parts for the complete set one by one against the list. In case of a missing or defective part, contact Mindray Animal Medical or your local dealer.**
 - **Place the product in a well-ventilated environment. Do not place other articles on the chassis.**
 - **Only the trained medical personnel are allowed to use the product for the specified purpose.**
-

1.2 Equipment Symbols

Symbol	Description
	Earthing terminal
	NOTE! Refer to instruction manual/booklet
	Equipotential
	Switch symbol
	Type BF applied part
	Humidity limitation
	Atmospheric pressure limitation
	Temperature limit
	Date of manufacture
	Manufacturer
	Serial number

Symbol	Description
	The following definition of the WEEE label applies to EU member states only: the use of this symbol indicates that waste electrical and electronic equipment must not be disposed of as unsorted municipal waste and must be collected separately. By ensuring that this product is disposed of correctly, you will help prevent bringing potential negative consequences to the environment and human health. For more detailed information with regard to returning and recycling this product, consult the distributor from whom you purchased the product.

FOR YOUR NOTES

2 Product Overview

2.1 Introduction

The Vetina ES3 Veterinary Flexible Endoscope Image System is a supporting equipment for the veterinary endoscope series of Mindray Animal Medical, which can be connected to the soft veterinary electronic endoscope of Mindray Animal Medical. The portable product is designed in an integrated structure and with a concise shape and convenient carrying. It supports one-click photography and video recording (an external USB drive needs to be connected). The product is equipped with a flip-type LCD to support the full view.

2.2 Intended Use

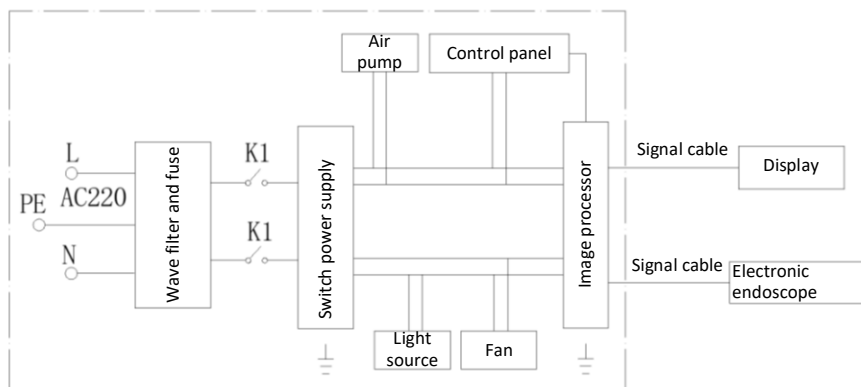
The Vetina ES3 Veterinary Flexible Endoscope Image System is a special supporting equipment for the veterinary electronic endoscope series of Mindray Animal Medical, which provides power supply, lighting, and image processing function for the veterinary electronic endoscope at the same time.

The system is for veterinary use only.

2.3 Operating Principle

Connect the power plug and the endoscope connector. After the main unit is powered on, the power module starts to operate. After the DC voltage is output, the other modules start to operate, and the cold light source module provides bright light. The CMOS converts the reflected light signals into electrical signals, which can be processed by the image processing module and transmitted to the display module to display an image. The image can be adjusted and locked by the control module. Besides, the display can be adjusted independently. The air pump switch can be controlled to supply air to the body or flush the lens using water.

The electrical schematic diagram is as follows:



2.4 Structure Compositions

The product is composed of the LCD module, image processing module, switch power supply module, control module, cold light source module, etc. Figure 2-1 and Figure 2-2 show its front panel structure diagram and rear panel structure diagram, respectively.

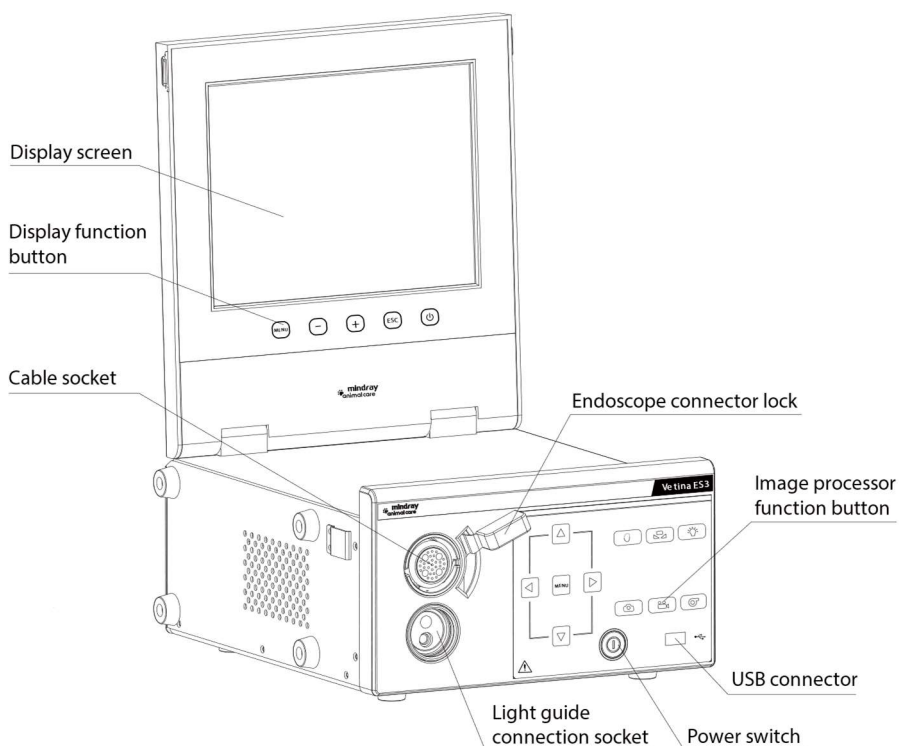


Figure 2-1 Front Panel Structure of the Product

Display screen:	For the operator to view the image
Display function buttons:	For details, refer to 4.3 Display Buttons
Cable socket:	Connects to the endoscope control signal
Light guide connection socket:	Connects to the endoscope connector for lighting and air supply
Power switch:	Provides the main power of Vetina ES3
USB connector:	Saves photos and videos and connects to the keyboard
Image processor function buttons:	For details, refer to 4.2 Image System Buttons
Endoscope connector lock:	Locks the cable connector and light guide connector

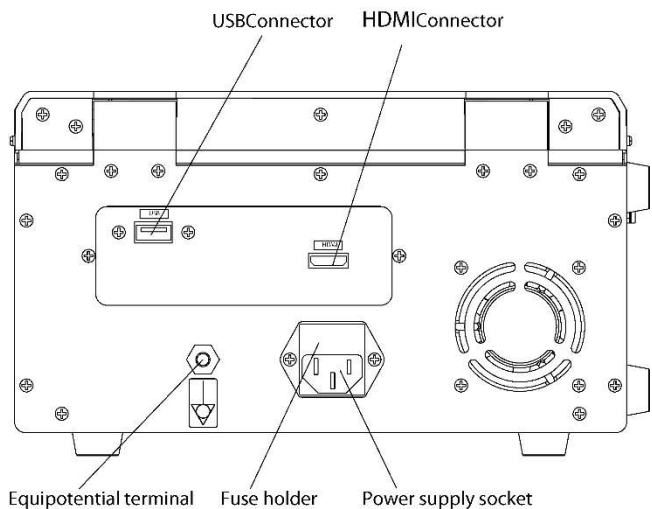


Figure 2-2 Rear Panel Structure of the Product

USB connector:	Saves photos and videos and connects to the keyboard
HDMI video output:	Outputs HDMI video image, connects to display, etc.
Power supply socket:	Power supply connection socket
Fuse holder:	With a fuse installed inside to prevent the impact of surge current
Equipotential terminal:	Connects to the grounding device

2.5 Main Functions

Main functions of the product are as follows:

- White balance function;
- Two metering modes are available: average metering and peak metering;
- Contour enhancement function;
- Image brightness and color saturation adjustment function;
- Image freezing and playback functions, able to freeze real-time images and play back stored images;
- Parameter saving function;
- Independent air pump switch function;
- Equipped with LCD parameter adjustment buttons, able to turn on/off the display separately.

2.6 Connected Device

Connected endoscope: the soft veterinary electronic endoscope produced by Mindray Animal Medical.

2.7 List of Main Electrical Components

1. 250 V 10 A three-core power plug and socket;
2. 12 V axial flow fan;
3. AC220V to DC12V switch power supply;
4. $\varnothing 5 \times 20$ mm, 1.6 A, 250V fuse (021601.6MXP);
5. Image processing board;
6. Control panel;
7. Self-locking button switch with light;
8. 12 V air pump;
9. Cold light source for medical endoscope;
10. LCD;
11. LCD driving circuit board.

2.8 Packing List

Name	Qty
Vet Flexible Endoscope Image System	1
Power cord	1
Video cable	1
Fuse	2
Operator's Manual	1

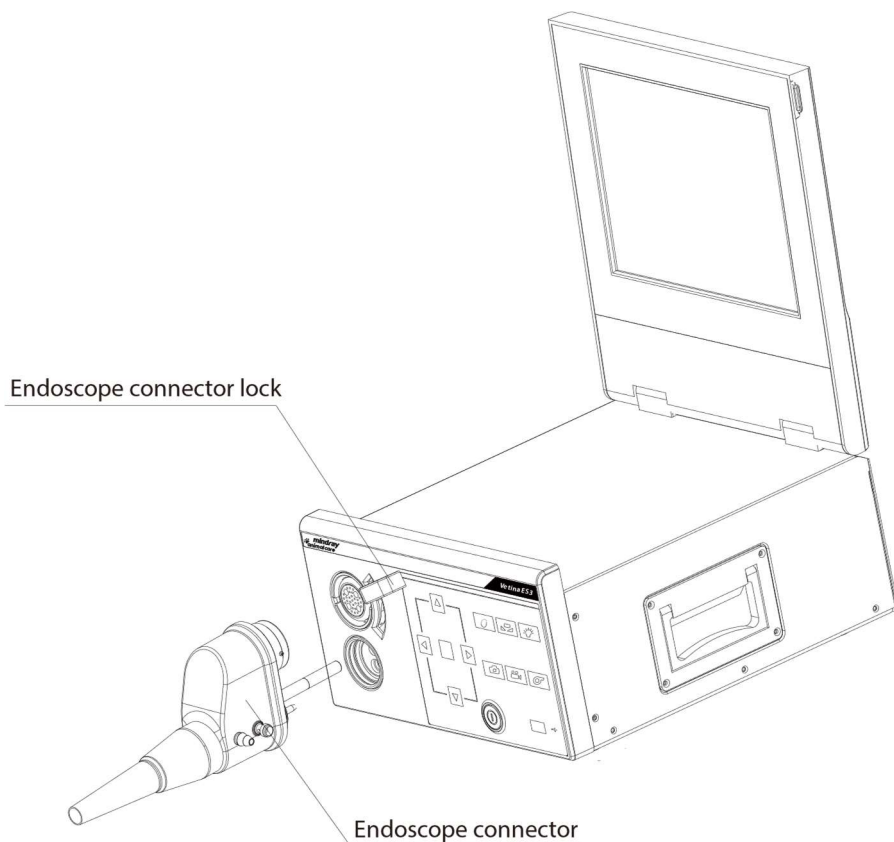
NOTE

- Check the parts one by one against the above list. In case of a missing or damaged part, contact Mindray Animal Medical in a timely manner.
-

3 Installation

Install the Vetina ES3 Veterinary Flexible Endoscope Image System by following the steps below:

1. Connect the power cord to the power supply socket at the rear of the main unit.
2. Insert the endoscope connector and the cable connector of the electronic endoscope into the light guide connection socket and the cable socket firmly.
3. Use the electronic endoscope connector lock to lock the connector clockwise. If locking fails, insert the endoscope connector and the cable connector firmly with proper force. See the figure below.



NOTE

- Before connection, make sure that the switch of the image system is off.
-

4 Operation Instructions

4.1 Starting Device

After the product is installed, perform the following operations:

1. Turn on the LCD and press the power switch (the switch indicator lights on). The display will output the image after the LCD is turned on completely.
2. Press the light source button on the function button panel of the image system to turn on the cold light source.



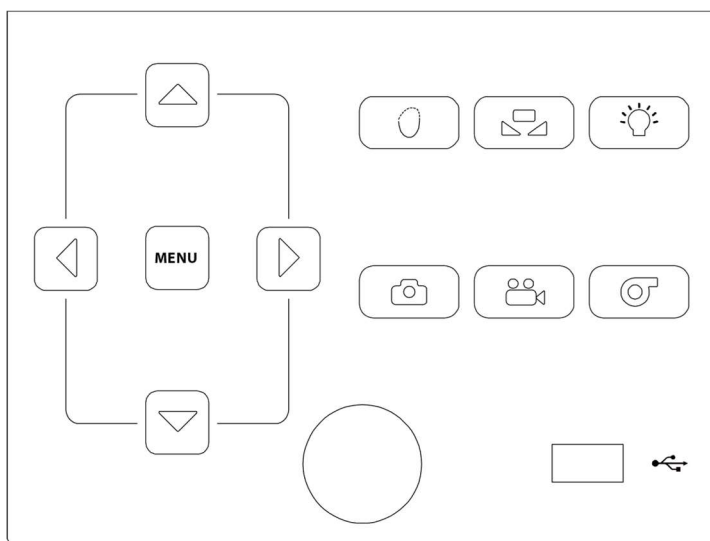
CAUTION

- **Before use, check whether the grounding is reliable, whether the fuse is in good condition, and whether each air vent of the chassis is unblocked.**
-

4.2 Image System Buttons

4.2.1 Button Instructions

Operating the function buttons of the product can achieve your purpose of using the product and display the image effect. The figure below shows the buttons on the display module.



Button	Function
	Light source button. Press the function button to turn on the light source, and press it again to turn off the light source.
	White balance button. After the product is connected according to the installation instructions, check whether the color of the endoscope image on the monitor is normal. In case of color deviation, reset the color. Aim the front end of the endoscope at a white object and press the white balance button to allow the system to set the white balance. When the button is just pressed, the screen displays "White Balance Calibration In Progress" . The text will disappear after white balance is set. Note: the endoscope head cannot leave the white object while you are waiting for the completion of white balance setting.
	Clarity button. The button can enhance the image's sharpness. Press the button to adjust the sharpness level in turn. The screen will display the character information Sharpness 0 or Sharpness 1 or Sharpness 2 or Sharpness 3 .
	Air Pump button. Press the button to turn on the air pump, and press it again to turn off the air pump.
	Video button. Press the button to start video recording, and press it again to stop video recording.
	Photo button. Press the button to take a photo, and press it again to store the photo.

Button	Function
	Menu button. You can adjust the main menu options as needed. Press the button to enter the main menu, and press it again to save your setting and exit the main menu.
	Menu combination button. Press the button to adjust options or values.
	Menu combination button. Press the button to adjust options or values.
	Menu combination button. Press the button to select a menu item upward, which can be selected circularly upward and downward.
	Menu combination button. Press the button to select a menu item downward, which can be selected circularly upward and downward.

4.2.2 Main Menu Instructions

After pressing the  button to enter the main menu, you can adjust the relevant parameters.

NOTE

- **It is not recommended to use Factory Settings function. Once used, you need to adjust the relevant parameters according to the Recommended Value to get the best result.**

Menu Item	Value Range	Recommended Value	Function
Brightness	0~100	55	Adjusts the image brightness
Contrast	0~100	60	Adjusts the image contrast
Hues	0~100	35	Adjusts the image hue
Saturation	0~100	40	Adjusts the image saturation
Sharpness	0, 1, 2, 3	1	Enhances the image contour

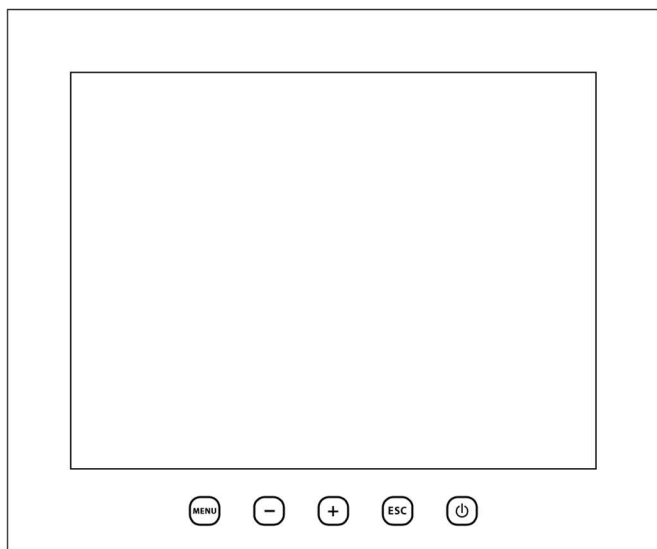
Menu Item	Value Range	Recommended Value	Function
Centre Preview	Open, close	Open	Adjusts the image position
Cover	Octagonal, Round, No	Octagonal	Adjusts the image chamfering
Language	Chinese, English	Factory default setting	Adjusts the menu language
File Export	/	/	Used to export files
System Upgrade	/	/	Inserts the USB drive with the upgrade program to upgrade the program
Time Setting	/	/	Adjusts time
Factory Settings	/	/	Restores factory settings
Exit	/	/	Exits the menu

4.3 Display Buttons

Display buttons are mainly used to adjust the relevant parameters of display screen during the production and after-sales maintenance. Display Buttons are shown as figure below.

NOTE

- **It is not recommended to use the display buttons. Once used, press  button to exit the menu, or contact Mindray Animal Medical's Customer Service Department.**



4.4 After Use

After use, turn off the power switch on the front panel, remove the endoscope cable and the endoscope connector, unplug the power cord, and properly place the image system and the electronic endoscope.

FOR YOUR NOTES

5 Maintenance

5.1 Cleaning Chassis

Before cleaning the body of the product, please remove and check the power cord, and ensure that the power plug is dry; otherwise, an electric shock would be caused.

If any liquid is spilled on the equipment, wipe it clean in time, and ensure that no water adheres to the equipment before the operation, especially the circuit connector. If there is water at the circuit connector, do not start operation until the water evaporates completely.

How to clean the outside of the chassis: use soft gauze soaked with diluted detergent to gently wipe the outside.



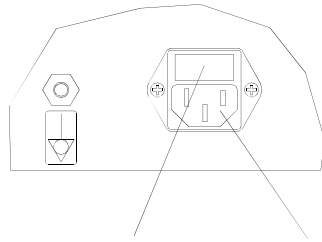
WARNING

- **When wiping the rear panel, note to avoid wetting the cable socket, other video signal terminals and sockets. Otherwise, it may cause the danger of deformation, electric shock, or corrosion.**
 - **Using the product with a wet circuit may cause an electric shock or short circuit fault.**
-

5.2 Replacing Fuse

If the product fails to operate normally after you press the power switch, the fuse may be broken. Replace the fuse as follows.

1. Turn off the power switch and pull out the power plug from the socket.
2. Pull out the protective cover and take out the fuse from the fuse holder for checking. See the figure below.



Fuse holder

Power supply socket

- a) If the fuse is found to be blown, replace it with the spare fuse immediately.
- b) Replace the fuse with a fuse (021601.6MXP) specified in the design. Using other fuses of different specifications may lead to dangers such as electric shock and fire. Therefore, never use an over-rated or under-rated fuse.
- c) After replacing the fuse, connect the power supply again. After the power switch is turned on, if you find that the fuse is blown again, turn off the power switch, pull out the power cord, and then contact Mindray Animal Medical.



WARNING

- **To replace the fuse due to the risk of electric shock, be sure to pull the power plug out of the socket.**
-

6 Troubleshooting

In case of the following faults, if troubleshooting according to the check methods described below does not work, please stop use and contact Mindray Animal Medical's Customer Service Department.

Symptom	Check Item	Solution
The endoscope processor is not energized	The endoscope processor is not connected to an external power supply	Connect the power supply
	The fuse is broken	Replace the fuse with a new one
	The external power supply socket is not energized	Repair the power supply socket
The monitor does not display the endoscope image	The power supply of the image system is not connected	Connect the power supply of the image system
	The MENU button is not pressed	Press the MENU button on the front panel
	The display screen is not turned on	Press the display switch button
The endoscope image is too dark or too bright	The set metering mode is improper	Adjust the metering mode
	There is a problem with the light source device: The bulb is installed incorrectly The bulb is too old to light up	Install the bulb correctly Replace the bulb
The endoscope image displays abnormal color or has no color	Color setting is improper	Reset the color
	White balance setting is improper	Perform the white balance procedure
	The monitor chroma setting is improper	Set proper monitor chroma
The endoscopic image is still	The freeze switch is still set	Press the freeze switch on the endoscope again to restore the active image

Symptom	Check Item	Solution
The image jitters and drifts and interference ripple is found	The selected monitor system is improper	Set the correct system
	There is an interference source near the workplace	Remove the interference source



CAUTION

- If you suspect that the product fails, please stop use immediately and contact Mindray Animal Medical or an authorized service agent. Otherwise, it may cause injury to the object of examination.
-

NOTE

- If the fault still exists after overhauling according to instructions of the troubleshooting and maintenance table, contact Mindray Animal Medical or an authorized service agent.
 - In case that any parts and electronic components of the Vetina ES3 Veterinary Flexible Endoscope Image System are damaged, be sure to use the parts provided by Mindray Animal Medical. Mindray Animal Medical shall not be held responsible for repairing the device damaged due to using parts forbidden by Mindray Animal Medical.
 - Mindray Animal Medical shall not be held responsible for the personal injury and product damage caused by persons not authorized by Mindray Animal Medical when repairing the device.
 - When the main unit needs to be sent back for repair, it must be packed using the original liner, put into the original packaging box, attached with the fault description document and the after-sales repair sheet, and sent to Mindray Animal Medical or an authorized service agent.
-

7 Specifications

7.1 Safety Classification

- a) Protection degree of the device to harmful liquid feed: common device
- b) Application part of the device: endoscope
- c) Device operation type: continuous operation
- d) The product cannot be used in an environment with flammable anesthetic gas mixed with air or oxygen or nitrous oxide.

7.2 Operating Environment

Ambient temperature range: +5°C to +40°C

Relative humidity range: 30% to 85%

Atmospheric pressure range: 70.0 kPa to 106.0 kPa

Rated voltage: AC 220 V

Rated frequency: 50 Hz

Input power: 100 VA

7.3 Storage Conditions

- a) Ambient temperature range: -20°C to +55°C
- b) Relative humidity range: 10% to 95%
- c) Atmospheric pressure range: 50.0 kPa to 106.0 kPa

Before storage, turn off the power switch of the image system and unplug the power cord.

Store the packaged endoscope image system in an indoor, cool, dry and well-ventilated area with relative humidity not exceeding 80%, free of corrosive gases, flammable and explosive gases, liquid contamination, and chemicals.

7.4 Transportation Conditions

Take measures to prevent impact, violent vibration, and moisture during transportation.

FOR YOUR NOTES

