## Operation Instructions

Connect the power cord (when the mains supply is used) -> Connect the earth wire (when necessary) -> Load the recorder paper -> Connect the patient cable to the patient cable socket on the right side of the unit -> Connect the lead wires of the patient cable to the electrodes -> Clean the electrode areas on the body surface with 75% alcohol -> Daub the electrode areas with gel evenly -> Attach all the electrodes to the animal -> press the mains switch on the left side of

the unit (when the mains supply is used) ->   Press $\left(\text{ON/OFF}\right)$ to turn on the device.

1 Attaching Lead Wires and Electrodes, Checking ECG Signals
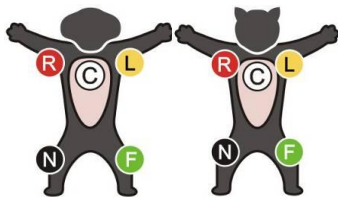
European Standard   **American Standard**
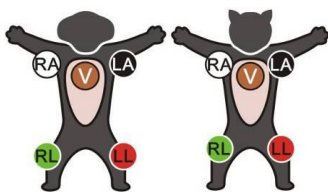
Dog   **Cat**   **Dog**   **Cat**

Signal Quality Indicators

See the hint information and ECG waves displayed on the LCD screen of the electrocardiograph.

Phenomena

➢ The hint *Lead Off* is displayed
➢ A lead name is highlighted

➢ An ECG wave shows a straight line

Indications

➢ Loose electrode connection
➢ Loose patient cable connection

Possible Causes

➢ Inoperative electrode, the electrode falls off the animal
➢ Loose connection between the patient cable and the patient cable socket of the electrocardiograph
➢ Loose connection between lead wires and electrodes

2 Entering Animal Information

After the electrocardiograph is switched on, it begins sampling ECG.

1. Enter the information of sex and age on the main interface.

1) Press the Up or Down arrow to select the sex or age item.

2) Press the Left or Right arrow to enter the information of sex or age

2. The system generates ID automatically according to the examination time. You can also enter ID manually in the following way.

Press the **MENU** key to open the system setup interface. Press the Up or Down arrow to select the ID item. Press the Left or Right arrow to set the ID item. Then press **MENU** to return to the main interface.

3 Printing an Auto ECG Report

1) Press **MODE/RST** to select **AUTO**. The printing mode *AUTO* is displayed on the LCD screen.

2) Press **PRINT/STOP** to print an ECG report.

3) Pressing **PRINT/STOP** again can stop printing the report.

Printing Troubleshooting

Phenomena	Solutions
Paper-jam	Open the recorder casing, pull the paper out, tear the pages with rumples, and replace the paper in the right direction.
The hint *PaperErr* is displayed	It might be the result of unsuccessful detection of the black markers. Check whether the black marker is on the top of the paper.
The hint *Paper?* is displayed	Check whether the paper runs out, or the black marker is just facing the black marker detection window on the thermal print head.

Navigation Tips

Opening/Closing the System Setup Interface

1) Press **MENU** to open the system setup interface.

2) Press **MENU** again to exit the system setup interface and save the modifications.

Opening/Closing the Recall Window

1) Press **RECALL** to open the recall window.

2) Press **RECALL** again to exit the recall window.

Setting an Item

1) Press the Up or Down arrow to select an item.

2) Press the Left or Right arrow to select an option for the item.

Selecting a Button Function in the Recall Window

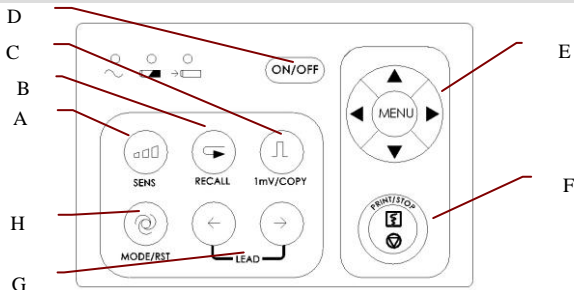When the cursor is on a button, press **MENU** to select the button function.

Main Interface

Top Row (from left to right):

♦ Animal Symbol (Select the symbol and press the left or right arrow to open animal information window)

♦ Animal ID, gender, age

♦ Printing mode

♦ Heart rate

♦ Current time and battery capacity symbol (The battery capacity symbol appears only when the built-in battery is used.)

Bottom Row (from left to right):

♦ Filter, sensitivity, printing speed

♦ Electrode identifiers (The highlighted electrode identifiers show the status of Lead Off, which means electrodes fall off the patient or the patient cable falls off the unit.)

♦ Hint information (Paper?, Printing, Sampling, Bat Weak etc.)

Keyboard and Keys

A	Sensitivity Switch Key	The sensitivity switch order: ×10 mm/mV → ×20 mm/mV → AGC (Auto Gain Control) → ×2.5 mm/mV → ×5 mm/mV.
B	Recall Key	Press the **RECALL** key to open the recall window.
C	1mV/COPY Key	In the **MANUAL** mode, press this key to print a 1mV calibration mark while printing ECG reports. In the **AUTO** mode, once the hint information *COPY* appears on the LCD screen, pressing the **1mV/Copy** key can print the ECG report which was printed out last time.
D	ON/OFF Key	Press this key to turn on or off the device.
E	MENU Key	Press this key to open the system setup interface.
	Up Arrow/Down Arrow Key	Press the Up or Down arrow to select an item on the main interface and the system setup interface.
	Left Arrow/Right Arrow Key	Press the Left or Right arrow to set the selected item.
F	PRINT/STOP Key	Press this key to begin or stop printing ECG reports.
G	LEAD Switch Key	In the **MANUAL** mode, press this key to switch the lead group. Press this key to switch to the previous or next page of the system setup interface, or press this key to switch to the previous or next page of records in the recall window.
H	MODE/RST Key	Press this key to select a printing mode among **AUTO**, **MANU**, **OFF-AUTO,**

		RHYT, OFF- RHYT and **R-R**. In the **MANUAL** mode, press this key to reset the waveform quickly while printing ECG reports.

Socket and Interface

Patient Cable Socket   RS232 Socket   USB Interface   External Input/Output Socket

Net Port

Loading paper

1) Place fingers under the two flanges of the recorder casing, pull them upwards directly to release the casing.

2) For the folded paper, remove remainder paper in the paper tray if necessary. Take off the wrapper of the new folded thermal paper, and then put it in the paper tray. Pull about 2 cm of paper out with the grid side of the paper facing the thermal print head, and shut the recorder casing.
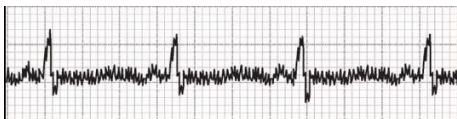
3) For the rolled paper, take out the paper roller, and remove remainder paper from the roller if necessary. Take off the wrapper of the new thermal paper roll, and then put the

paper roll through the roller. Place the paper and the roller gently in the recorder with the roller pin clicking into the groove. Pull about 2 cm of paper out with the grid side of the paper facing the thermal print head, and shut the recorder casing.

4) Press down the recorder casing firmly.
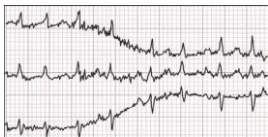
Signal Quality Troubleshooting

AC Interference

Possible Causes	Solutions
➢ Electrical interference from another device (microwave oven, cellular phone, wireless device, etc.)	➢ Look for devices that could be causing electrical interference, and then turn off the devices. Or run the electrocardiograph on the battery power
➢ An improperly-grounded electrical device near the electrocardiograph	➢ Lay lead wires alongside the limbs and away from any electrical devices
➢ An improperly gelled electrode (dried gel)	➢ Turn on the AC filter on the system setup interface

Wandering Baseline

Possible Causes	Solutions
➢ Moderate animal movement	➢ Ensure that the lead wires are not pulling at the electrodes and that the electrodes are firmly attached
➢ Very poor electrode contact	➢ Set the DFT filter to **0.67Hz** on the system setup interface
➢ Animal respiratory interference	➢ Press **MODE/RST** to draw the baseline to zero quickly

Somatic Tremors

Possible Causes	Solutions
➢ The animal is cold and shivering	➢ Place a blanket on the animal to warm the animal
➢ The animal has tremors	➢ Assist with limiting animal movement
	➢ Decrease the set value of the EMG filter on the system setup interface

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