USER MANUAL

ELECTROCARDIOGRAPH

FOR ANIMAL

Statement

In order that you can use this product more safely and get full play to its functions and features, please read the operating instructions carefully before using this unit and keep it properly.

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This ECG machine is such a kind of electrocardiograph, which samples 12 leads ECG signals simultaneously and prints out the ECG waveforms with thermal printing system. Its functions are as follows: recording and displaying ECG waveforms in auto/manual mode; auto-measuring and auto-diagnosing the ECG wave parameters; save patient data into machine, USB driver or SD memory card automatically, prompting the state of lead off; switching the window languages.

The content of this manual is subject to change without prior notice.

Contents

Chapter 1 Security Guidance

1.1 Safety Information

The design of this digital ECG electrocardiograph (ECG) complies with 《international standard IEC 60601-1》, 《Medical Electrical Equipment: General Requirements for Safety and IEC 60601-2-25, Particular Requirements for Safety of Electrocardiograph》, and the Chinese standard《GB9706.1, Medical Electrical Equipment: General Requirements for Safety》 , 《Medical Industry Standard YY1139, Single and multi-channel electrocardiograph》, and《YY 0505-2012 Medical electrical equipment - Part 1-2 :General requirements for Safety - parallel standard: electromagnetic compatibility requirements and tests》. The classification of the equipment is Class I, type CF applied part, which means a higher degree of protection against electric shock and the patient connection is fully isolated and defibrillation protected.

According to defense degree of deleterious fluid is IPX0.

According to the safe degree used under the condition with flammable anesthesia gas mixed with air (or oxygen, nitrous oxide), this device belongs to the device which can't be used under the condition with flammable anesthesia gas mixed with air(or oxygen, nitrous oxide) .

The equipment is designed for continuous operation but it is not drip-proof or splash-proof.

Safety classification is listed as below Table 1-1.

Table 1-1 Safety classification

Anti-electric-shock type	Class Ⅰwith internal supply
Anti-electric-shock degree	CF
Degree of protection against harmful ingress of water	Ordinary equipment (Sealed equipment without liquid proof)
Disinfection/sterilization method	Refer to the Operation Manual for detail
Degree of safety of application in the presence of flammable gas	Equipment is not suitable for use in the presence of flammable gas
Working mode	Continuous operation
EMC	Group Ⅰ, Class B

1.1.1 Environment Requirements

Please find in table 1-2 for environment requirements of transportation, storage and working condition of ECG machine.

The transportation condition must be stated by the contract. The ECG must be stored in the place which need meet the requirements listed in table 1-2.

Be sure that the operation environment is clean, and the ECG is kept away from corrosive gas, high humidity, high temperature or direct sunshine. Avoid shaking during operating and do not move the ECG when it is powered on.

Table 1-2 Environment Requirements

	Transportation	**Storage**	**Working**
Temperature	-20℃~+55℃	-10℃~+40℃	+5℃~+40℃
Relative Humidity	25%~95%	25%~85%	25%~85%
Atmosphere Pressure	700hPa~1060hPa	700hPa~1060hPa	700hPa~1060hPa

1.1.2 Power Supply

1) AC Power Supply

Rated voltage: 100V-240V

Rated frequency: 50Hz/60Hz

Rated power: 60VA

2) Built-in Lithium Rechargeable Battery

Rated voltage: 11.1V

Rated capacity: 2000mAh

1.2 Security Notice

WARNING

1) The power supply should be grounded properly before operation.

2) If the ground cable is not integrated, the device must run with built-in power supply.

3) Please pull out power supply plug before changing the fuse.

4) This device must be operated and preserved by professional personnel.

5) The operator must read this user manual carefully before operation, and operate the device according to operation regulation strictly.

6) The design of this device has fully considered security, but operators should never neglect to device state and patient's situation.

7) Please turn off the instrument and pull out power supply plug before cleaning and disinfection.

8) Please don't operate this device in environment which contains flammable anesthesia gas.

9) If this device is used with cardiac defibrillator or other electric stimulate devices at the same

time, please choose Ag/AgCl chloride chest electrode and ECG lead with prevent-fibrillation function. To prevent the metal electrode burn patients' skin, the disposable chest electrode should be used if the defibrillation time is over 55 seconds. It is better that do not use this device with other electric stimulate devices at the same time. If it must be used at the same time, there must be professional technician guide on the scene.

10) When other devices are connected with this ECG instrument, they must be type I devices which accord with IEC60601-1. Because the total amount of leakage current may hurt patients, the monitoring of leakage current is carried out and taken charge by connect devices.

11) ECG machine is designed to carry on ECG trace interpretation immediately after the measurement. It is this interpretation that does not give report on all possible heart problems and may sometimes not comply with the doctor's diagnosis. Therefore, the final conclusion concerning each patient is up to the doctor basing on patient symptom, the unit ECG's interpretation and other examination.

1.3 Precaution for Battery Operation

1.3.1 Battery information

1) This instrument is designed with the built-in sealed maintenance-free rechargeable lithium battery, and has automatic charge and discharge monitoring system. The instrument recharges the battery automatically when connect to AC power supply. The display will show the current power state at the down right corner when the instrument turns on.

2) The device can continuously work 6 hours without printing after the battery fully charged. When it working, the display shows the signal of the battery status in 4 degree. When the power of battery is too low to operate, the instrument will turn off automatically to avoid damage to the battery.

3) The battery should be recharged in time after exhausted using. For long storage, the battery is to be recharged every 3 months. The battery life can be extended by doing so.

4) When the battery cannot be recharged or works no more than 10 minutes after fully charged, please change the battery.

1.3.2 Battery care warnings

⚠WARNING⚠

- Improper operation may cause the battery to be hot, ignited or exploded, and it may lead to the declination of battery's capacity. It is necessary to read the Operation Manual carefully and pay more attention to warning messages.
- Opening the battery cover to disassemble or replace battery should be done according to the Operation manual, and only battery of the same model and specification provided by manufacture should be used.
- Danger of explosion- Do not directly connect both "+" and "-" poplars of battery with wire, otherwise it might cause fire hazard.
- Do not use battery around fire or place over 60℃. Do not heat or splash the battery. Do not throw it into fire or water.
- When leakage or foul smell found, stop using the battery immediately. If your skin or cloth

comes into contact with the leakage liquid, clean it with net water at once. If the leakage liquid splashes into your eyes, do not wipe them, irrigate them with clean water firstly and go to see doctor immediately.

- When the battery's useful life is over or any abnormal phenomenon is found from the battery, please stop using it, and contact with the manufacturer or local distributor for disposal or dispose the battery according to the local regulations.

1.4 General Notes

Make sure the status of the instrument is power off, and then make the instrument be properly grounded through a 3-prong outlet. When the outlet, a grounding cable may be utilized to connect the grounding terminal of the instrument. Do not use other pipeline. Properly grounding could guarantee the safety and prevent from the interference of AC power and electromagnetic wave.

NOTE

- Avoid liquid splash and excessive temperature. The temperature must be kept between 5℃ to 40℃ while working, and between -20℃ and 55℃ during transportation, and between -10℃ to 40℃ during storage.
- Do not use the ECG in dusty environment with poor ventilation or in the presence of corrosive.
- Be sure that there is no intense electromagnetic interference source around the equipment, such as radio transmitter or mobile phone etc.

Attention: Large medical electrical equipment such as electrosurgical equipment, radiological equipment and magnetic imaging equipment etc. are likely to bring electromagnetic interference.

NOTE

- Check the main unit and its accessories carefully before operating the ECG. Replacement should be taken if there is any evident defectiveness or aging symptom which may impair the safety performance.
- Fuses must only be replaced with the same type and rating as the original.
- The equipment and reusable accessories can be sent back to the manufacturer for recycling or proper disposal after their useful lives.

1.5 Cleaning and Disinfection Notes

NOTE

- Turn off the power before cleaning and disinfection. If mains supply used, the power cord should be drugged out of the outlet also. Prevent the detergent from seeping into the equipment.
- Do not immerse the unit or patient cable into liquid under any circumstances.
- Do not clean the unit and accessories with abrasive fabric and avoid scratching the

electrodes.

- Any remainder of detergent should be removed from the unit and patient cable after cleaning.
- Do not use chloric disinfectant such as chloride and sodium hypochlorite etc.
- Do not use high temperature, autoclaving or radiation sterilization processes.

1.6 Electro Magnetic Compatibility Information

The equipment must comply with IEC 60601-1-2 for medical equipment or EMC standard. The electromagnetic environment which exceeds the limits of IEC 60601-1-2 standard will generate harmful interference or degrade the performance. Please exclude adverse electromagnetic interference before using.

Common sources of interference and solutions:

1. Strong electromagnetic interference generated by the nearby emissive sources, such as broadcasting station, transformer substation and cell phone.

   Solution: Keep the equipment away from the emissive sources.

2. RF interference generated by other equipment or system through electric knife line.

   Solution: Determine the cause of interference and remove possible ones. If not, please change the power supply.

3. Direct and indirect influence from electrostatic discharge.

   Solution: Make sure that all equipment and system have no direct or indirect electrostatic energy before use. Humidor room can effectively reduce such interference.

4. Electromagnetic interference generated by radio receiver such as TV and radio.

   Solution: Try to keep this equipment away from the radio receiver.

If these methods con not solve the problem, please contact manufacture or the designated maintenance points.

Chapter 2 Instrument Characteristics

Digital 12 channels ECG is digital twelve channel physiological function measurement equipment which records the heart waveform during elect-biological movement. It provides sufficient information on the analysis of arrhythmia and cardiovascular disease, helps to know the pathological disorder caused by some drugs and electrolyte, or unbalance of PH value.

Standard configuration: Main unit and accessories, including patient cable, chest electrodes, limb electrodes, thermo sensitive print paper and power cord etc.

Intended use: The cardiogram and heart rate recorded by the ECG can help doctors to analyze and diagnose heart disease or arrhythmia in hospitals. Its compact size makes it suitable for use while visiting patients at home.

NOTE

The patient who has a heart disease may have a normal electrocardiogram, so other tests are required for a full hearts appraisal. This equipment cannot be connected to the heart directly.

2.1 Function Features

This digital 12 channels ECG is equipped with a 10.2 inches TFT touch screen. Here below are the main features and functions of this ECG machine.

- Modern in design, light in weight, compact in size.
- Simultaneously acquisition of 12 lead, full screen display of 12 channel ECG waveforms.
- TFT touch screen and full touch operation.
- Sensitive filters of ADS, HUM, and EMG.
- Automatic measurement, calculation, analysis, waveform freezing. Auto-analyze and auto-diagnostic can reduce doctor’s burden and improve working efficiency.
- Automatic adjustment of baseline for optimal recording.
- 80mm thermal printer for 3 channel ECG machine and 50mm thermal printer for 1 channel ECG machine. It is high resolution thermo sensitive printer and thermal-array (8 dots/mm), you should not adjust anything Frequency Response is up to 150Hz.
- Lead off & lack off paper detection function.
- Built-in rechargeable li-ion battery (11.1V/2200mAh), AC/DC power conversion.
- Adapt to 100-240V, 50/60Hz AC power supply.
- Historical data and patient’s information can be reviewed and printed.
- Support USB flash disk & SD memory, stored reports can be saved, opened, analyzed in PC via ECG playback software.
- The machine can store over 500 ECG reports in its built-in flash.
- Standard RS232 and USB communication interfaces.

- Connect with PC via ECG workstation software.
- Sleep mode to save energy and extend display life.
- The device can record real time clear and exact 12 channel ECG waveform and remark continually. The remark includes: lead sign, sensitivity, paper speed, filter state, etc.
- Portable design with hidden handle, convenient to carry.
- 7 level printing thick can be chosen.

2.2 List of Symbols

Explanation of some symbols in this device

	Attention-general warning		Device type is CF, which has defibrillation protection function
	External output		Potential equalization
	External intput	**PATIENT**	Lead connector
	USB connector	**LAN**	Internet window
POWER	Power switch	**~AC SOURCE**	AC work mode
OFF	Power supply is disconnected	**ON**	Power supply is connected

2.3 List of Parameters

CMRR	≥ 100dB, with AC Filter	Calibrating voltage	1mV± 3%
Input circuit	Floating	Voltage tolerance	± 500mV
Input circuit current	≤ 0.1μ A	Time constant	> 3.2s
Resolution	12bit/1000Hz	Frequent response	0.05Hz~150Hz
Operation mode	Manual/Auto	Noise level	≤ 15μ Vp-p
Filter	AC. EMG Filter	Threshold	≤ 20μ V
Drift filter	Anti-Drift System	Paper speed	12.5, 25, 50mm/s (± 3%)
Input Impedance	> 50MΩ	Sensitivity	5，10，20mm/mV
Patient current leakage	< 10μ A	Recorder	High resolution thermal printer
Battery	Built-in rechargeable Li-ion battery	Recording paper	Thermal recording paper
Dimension	256mm*204mm*66mm		

Chapter 3 Panel Sketch Map

3.1 The sketch map and components name

Figure 3-1 Front view of ECG

① LOGO& Model
② Printer Cover
③ Open Cover Bar
④ Display Screen
⑤ Indicator Light
⑥ Run/Stop Button
⑦ On/Staby Button

3.1.1 Product Information

- LOGO
- Model
- Classification Symbol

Device type is CF, which has defibrillation protection function.

3.1.2 Display

There are two models for 1 & 3 channel ECG machine, those are equipped with 4.3 inches or 7 inches TFT touch screen respectively.

3.1.3 Guiding Lights

3.1.3.1 Guiding lights of ECG machine

This indicator is lighted when AC power supply is prepared. At the same time, the battery will be charged automatically until it is full.

This indicator will be constant lighted when the built-in battery is charged, and it will be turn off after the battery is charged full. If the capacity of built-in battery is weak, this indicator will flash until AC power is used.

This indicator will be constant lighted when it is working. And the indicator will be extinct when the machine is turned off.

3.2 Main Connection and Switch

① Connector for Power Adapter

② Connector for Ground Wire

Figure 3-2 Rear view of ECG

1) This machine will be connected AC power by using the specific power adapter. For safety, please don't use other adapter which not provided by ECG manufacture.
2) If necessary, please connect the ground wire to the safe position correctly.

NOTE

- When used with other medical equipment, please ground the ECG machine wit the grounding cable provided to protect patients from any possible electric shock caused by other equipment.
- Connect one end of grounding cable to the connector of the equipment and connect the other end to the ground to enhance reliability of grounding. Do not use pipe or the like as grounding cable, otherwise, the grounding cannot work and the patient has potential risk of electric shock.

3.3 Patient Cable connector and Signal Window

① USB Connector

② SD Card

③ Patient Connector

Figure 3-3 Side view of ECG

WARNING

- Auxiliary equipment connected to the analog and digital interfaces must be certified according to IEC standards (e.g. IEC60950 for data processing equipment and IEC 60601-1 for medical equipment). Furthermore all configurations shall comply with the valid version of IEC 60601-1. Therefore anybody, who connects additional equipment to the signal input or output connector valid version of the system standard IEC 60601-1. If in doubt, consult our technical service department or your local distributor.
- Total current leakage should not exceed current leakage limit while several other units are used at the same time.

1) Patient Cable Socket

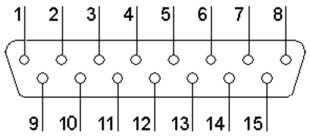


Figure 3-4 Patient Cable Socket

: Applied part of type CF with defibrillator proof.

Definition of corresponding pins:

Table 3-1 Patient Cable Definition of Pins

Pin	Signal	Pin	Signal	Pin	Signal
1	C2（input）	6	SH(shield)	11	F（input）
2	C3（input）	7	NC	12	C1（input）
3	C4（input）	8	NC	13	NC
4	C5（input）	9	R（input）	14	RF（Floating）
5	C6（input）	10	L（input）	15	NC

2) USB Socket

You can use U disk flash via this USB window to store more ECG data. The stored reports can be saved, opened, analyzed in PC via ECG playback software.

3) SD memory Socket

You can use SD memory card via this socket to store more ECG data. The stored reports can be saved, opened, analyzed in PC via ECG playback software.

3.4 Bottom Panel

① Product Label

② Battery Label

Figure 3-5 Bottom view of ECG

1) Battery Label

The ECG machine has built-in rechargeable li-ion battery, the rated capacity is 11.1V/2200mAh. The battery label indicates the battery usage considerations.

WARNING

- Improper operation may cause the battery hot, ignited or exploded, and it may lead to the decrease of battery capacity, it is necessary to read the Operation Manual carefully and pay more attention to warning message.
- When leakage or foul smell found, stop using the battery immediately. If your skin or cloth comes into contact with the leakage liquid, clean it with net water at once. If the leakage liquid splashes into your eyes, do not wipe them, irrigate them with clean water firstly and go to see doctor immediately.
- Opening the battery cover to disassemble or replace battery should be done according to the Operation manual, and only battery of the same model and specification provided by manufacture should be used.

2) Product Label

In the label there are information of product model, S/N, manufacture date, serial number, manufacturer name, etc.

Chapter 4 Operation Preparations

WARNING

Check the main unit and its accessories carefully before operating the ECG. Replacement should be taken if there is any evident defectiveness or aging symptom which may impair the safety or performance. Make sure that the equipment is in proper working condition.

4.1 Connecting to AC Power and Grounding

WARNING

3) To avoid any possible electric shock, please connect the ECG to AC power with a specific power adapter provided by ECG manufacture. please don't use other adapter which not provided by ECG manufacture.

- Don't open up the ECG while it is powered on.
- If the integrity of external protective conductor in installation or arrangement is in doubt, the ECG should be operated from the built-in rechargeable lithium battery.
- The ECG can be powered on by AC power or built-in rechargeable lithium battery.
- when necessary, please connect the ground wire to the safe position correctly.

1) AC Power Supply

The AC power socket is on the rear side of ECG.

Rated Voltage: 100V-240V

Rated frequency: 50Hz/60Hz

Rated input power: 60VA

WARNING

Make sure the status of the instrument is power off, and then make the instrument be properly grounded. When the outlet, a grounding cable may be utilized to connect the grounding terminal of the instrument. Properly grounding could guarantee the safety and prevent from the interference of AC power and electromagnetic wave.

2) Built-in Rechargeable battery

This instrument is designed with the built-in sealed maintenance-free rechargeable lithium battery, and has automatic charge and discharge monitoring system. The instrument recharges the battery automatically when connect to adapter. The display will show the current power state at the up right corner when the instrument turns on.

- The device can continuously work 6 hours without printing after the battery fully charged. When it working, the display shows the signal of the battery status in 4 degree. When the power of battery is too low to operate, the instrument will turn off automatically to avoid damage to the battery.
- The battery should be recharged in time after exhausted using. For long storage, the battery

is to be recharged every 3 months. The battery life can be extended by doing so.

- When the battery cannot be recharged or works no more than 10 minutes after fully charged, please change the battery.

ATTENTION

- Do not directly connect both “+” and “-” poplars of battery with wire, otherwise it might cause fire hazard.
- Possible explosion hazard if it kept nearby the ablaze area.
- You should not open or disassemble the battery.

4.2 Loading Recording Paper

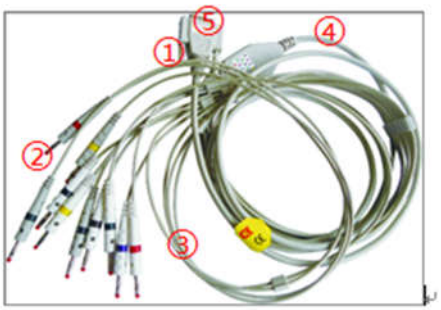
Figure 4-1 Loading Paper of ECG

The dimension of 3 channel thermal paper is 80mm (W) × 20m (L), and the dimension of 1 channel thermal paper is 50mm (W) × 20m (L).

Loading Procedures of Rolled Paper

1. Pull through the open button to open the paper compartment cover.
2. Take out the paper rollers, remove remaining paper necessary. Insert the rollers into the new roll paper and put the paper with rollers back into the paper compartment. Be sure that the paper is installed with the paper’s grid side facing downward.
3. Pull about 2cm of the paper out, and close the cover gently.

4.3 Patient Cable Connection



① Screw
② Electrode Connectors
③ Lead Wires
④ Main Cable
⑤ Connector

Figure 4-2 ECG Cable

Patient cable includes two parts, main cable and lead wires with associated electrode connectors. The electrode connectors can be distinguished from the color and identifiers on them.

Plug the connector of the main cable into the patient cable socket on the right side of the ECG. Secure the knobs on sides of the socket.

WARNING

- This ECG is CF classified and defibrillation protected only when the original patient cable is used. However, as a safety precaution when possible, remove electrodes before defibrillation.
- It is strongly recommended that only our patient cable be used when ECG is using with high frequency devices to avoid any possible signal interference.

4.4 Electrodes Connection

4.4.1 Electrodes Location

There are five clamp electrodes for7 leads ECG and ten clamp electrodes for12 leads ECG.

Figure 4-3 Cable and electrodes

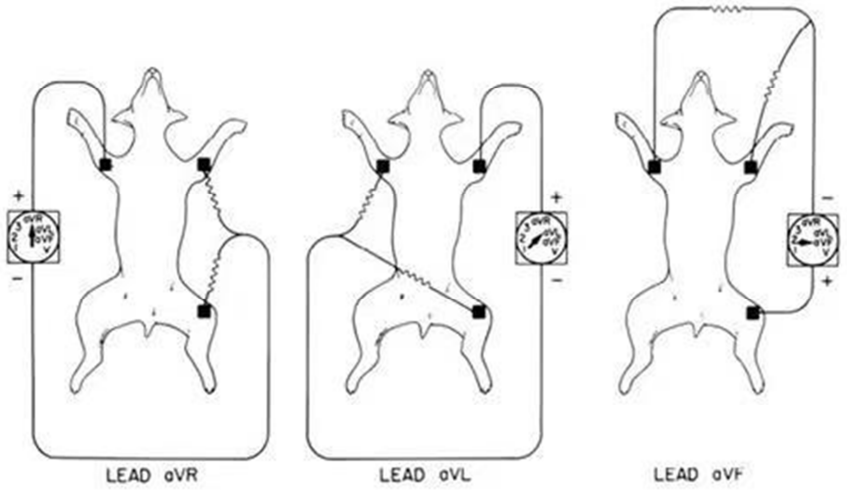


Figure 4-4 Chest Electrode Position

Attach the chest electrodes to the locations as following:

C1/V1: Fourth inter-costal space at right border of sternum.

C2/V2: Fourth inter-costal space at left border of sternum.

C3/V3: Midway between V2 and V4.

C4/V4: Fifth inter-costal space at left mid-clavicular line.

C5/V5: Left anterior axillary line at the horizontal lever of V4.

C6/V6: Left mid-axillary line at the horizontal lever of V4.

4.4.2 Check-List for Electrode connection and ECG cable

The identifier and color code of electrodes used comply with IEC requirements. In order to avoid incorrect connections, the electrode identifier and color code are specified in Table 4-1. The equivalent code of American standard is given too.

Table 4-1 Electrodes

	European		American		Socket Number
Electrodes	**Identifier**	**Color Code**	**Identifier**	**Color Code**	
Right Arm	R	Red	RA	White	9
Left Arm	L	Yellow	LA	Black	l0
Left Leg	RF	Black	RL	Green	11
Right Leg	F	Green	LL	Red	14
Chest 1	C1	White/red	V1	Brown /red	12

Chest 2	C2	White/yellow	V2	Brown/yellow	1
Chest 3	C3	White/green	V3	Brown/green	2
Chest 4	C4	White/brown	V4	Brown/blue	3
Chest 5	C5	White/black	V5	Brown/orange	4
Chest 6	C6C	White/violet	V6	Brown/violet	5

4.5 Inspection before Startup

In order to avoid safety hazards and get good ECG record, the following inspection procedures are recommended before turning on the ECG and beginning operation.

1) **Environment**
   - Check and make sure that there is no electromagnetic interference source around the equipment, especially large medical electrical equipment such as electrosurgical equipment, radiological equipment and magnetic resonance imaging equipment etc. Switch off these devices when necessary.
   - Keep the examination room warm to avoid muscle action voltages in ECG signal caused by cold.
2) **Power Supply**
   - If AC power used, please check whether the power adapter has been connected to the ECG and it is properly grounded.
   - Recharge the battery first before use when the battery capacity is low.
3) **Grounding**

   Check the grounding cable is properly connected.
4) **Patient Cable**

   Check whether the patient cable has been connected to ECG firmly, and keep it far away from the power adapter.
5) **Electrodes**
   - Check whether the patient cable has been connected with lead wires of patient cable correctly according to the identifier and color.
   - Be sure that all electrodes have been connected to the patient correctly.
   - Ensure that the chest electrodes haven’t contacted with each other.
6) **Recorder Paper**
   - Ensure that there is enough recording paper loaded.
   - Make sure the case of recorder has been calmly.
7) **Patient**

- The patient should not contact with conducting object such as earth, and metal part of bed etc.
- Ensure the patient is warm and relaxed, and breathe calmly.

8) AC Filter Frequency

Check the setup of AC filter frequency and make sure is identical with the local regulations, or it will influence the anti-jamming effect.

4.6 Precaution during Operation

- Pay attention to the patient and instrument condition constantly.
- Patient and instrument can only be connected ECG cables.
- Keep close observation of the patient and instrument, to make sure they are not moved during operation.
- Turn off the instrument after using.
- Turn off the power, and remove the ECG cables slightly without force.
- Properly keep the instrument and spare parts for operation next time.

Chapter 5 Operation Instructions

5.1 Display Menu

5.1.1 Navigation Window

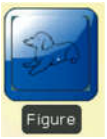
This navigation window will be appeared when it is turned on.

Figure 5-1 Navigation Window

This navigation window includes eight navigation menus.

Input the patient's information and create a new patient ECG file.

Inquire and review the patient's ECG report in this patient database.



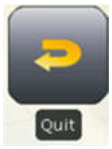
Hint the location of ECG electrodes.

Setup or adjust the current Date & Time.

Setup parameters

Help information of this ECG machine.

Information about the product and manufacturer



Quit the navigation window and enter into the ECG acquisition window.

5.1.2 Patient Information inputing

The following window will be appeared by touching 

.

Please input patient's information by touching the button of the bottom keyboard. The information includes * Name, Gender, Age, Height, Weight and SYS/DIA.

Return to the navigation window.

Enter into the ECG sampling window.

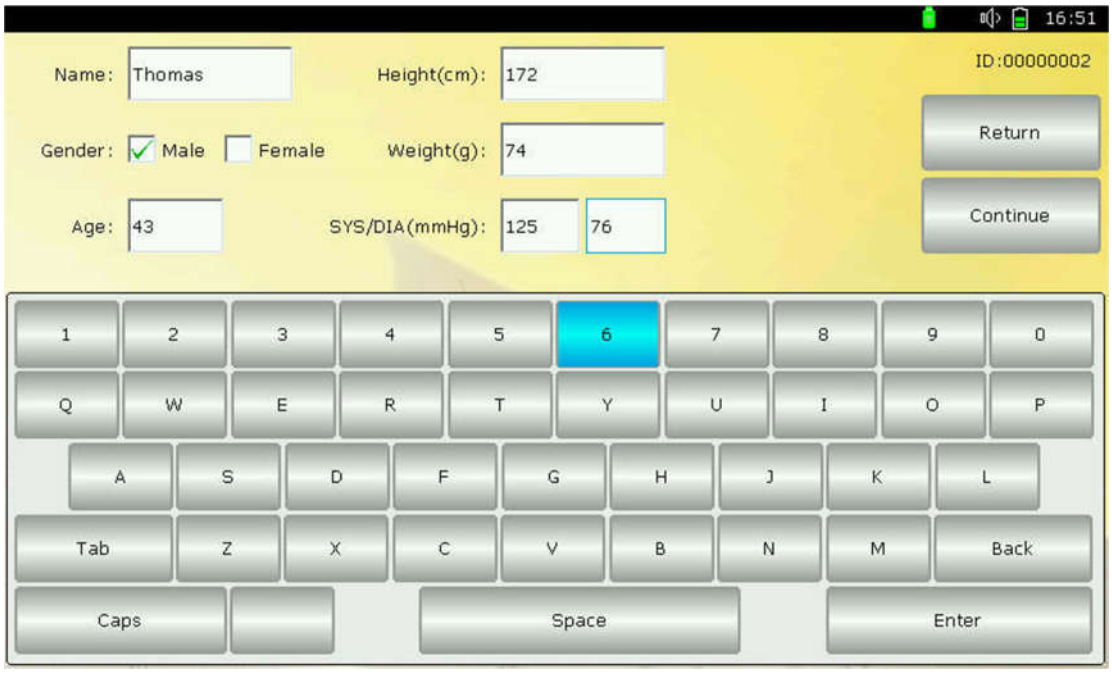


Figure 5-2 Patient Information Inputing Window

5.1.3 The patient database

The following window will be appeared by touching 

.

The patient ECG reports will be listed from top to bottom; you can choose every one you need by touching. You also can operate it by touch the bottom buttons.

-  Vertical scroll bar, touch it to Page up or Page down.
- 

List the patient's information.
- 

The total quantity and the current number of ECG reports.
- 

Export JPG format ECG report
- 

To the first page
- 

To the last page
- 

To the previous page
- 

To the next page
- 

Review the current ECG report as the following Figure 12.4.
- 

Delete the current ECG report.
- 

Delete all ECG reports.
- 

Return to the navigation window.

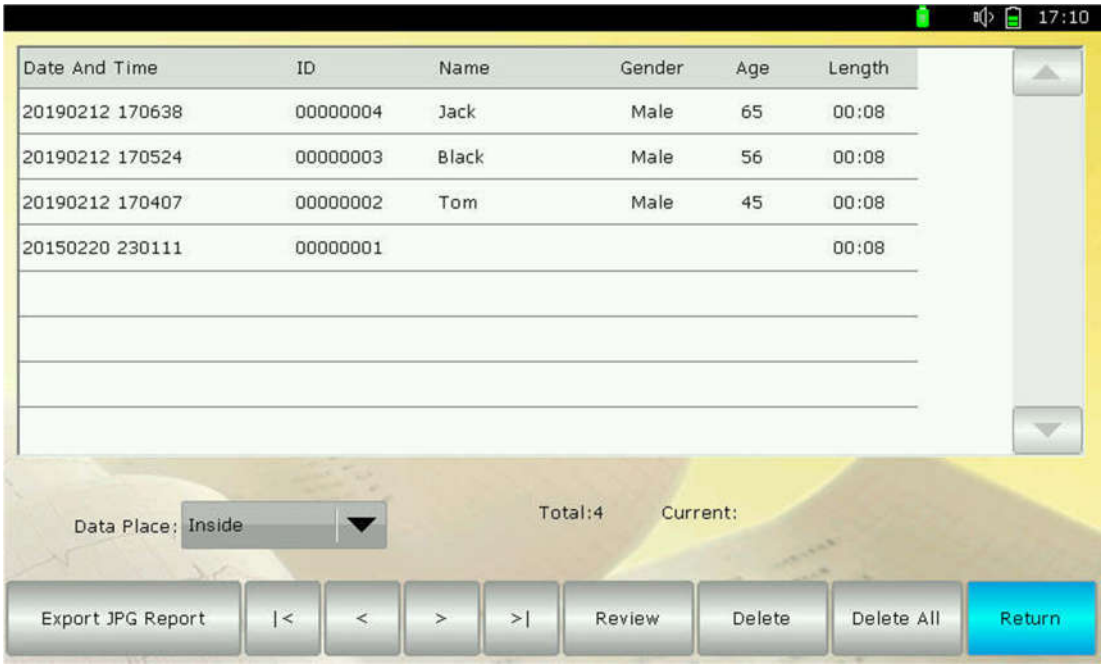
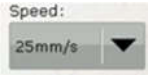


Figure 5-3 Patient database

Click 

to enter into review window.

- 

You can choose the gain of playback ECG waveform to 5mm/mV, 10mm/mV or 25mm/mV.
- 

You can choose the wave speed of playback ECG waveform as 12.5mm/s, 25mm/s or 50mm/s
- 

You can choose the displaying format of ECG report as 1 channel, 3 channel, 3 channel + rhythm lead, 3 channel + Ⅱ channel + V5 channel, 6 channel of single row, 6 channel of two rows or 12 channel.
- 

You can choose the printing format of ECG report as 3 channel, 3 channel + rhythm lead, 3 channel + Ⅱ channel + V5 channel, 6 channel or 6 channel + rhythm lead.
- 

Page up or page down
- 

Switch lead forward or backward.
- 

Display the ECG report of current ECG waveform.
- 

Printing/ stop printing ECG report.
- 

Start to review the current ECG waveform dynamically and you can touch “STOP” to stop review at any time.

- 

Return to the window of patient database.

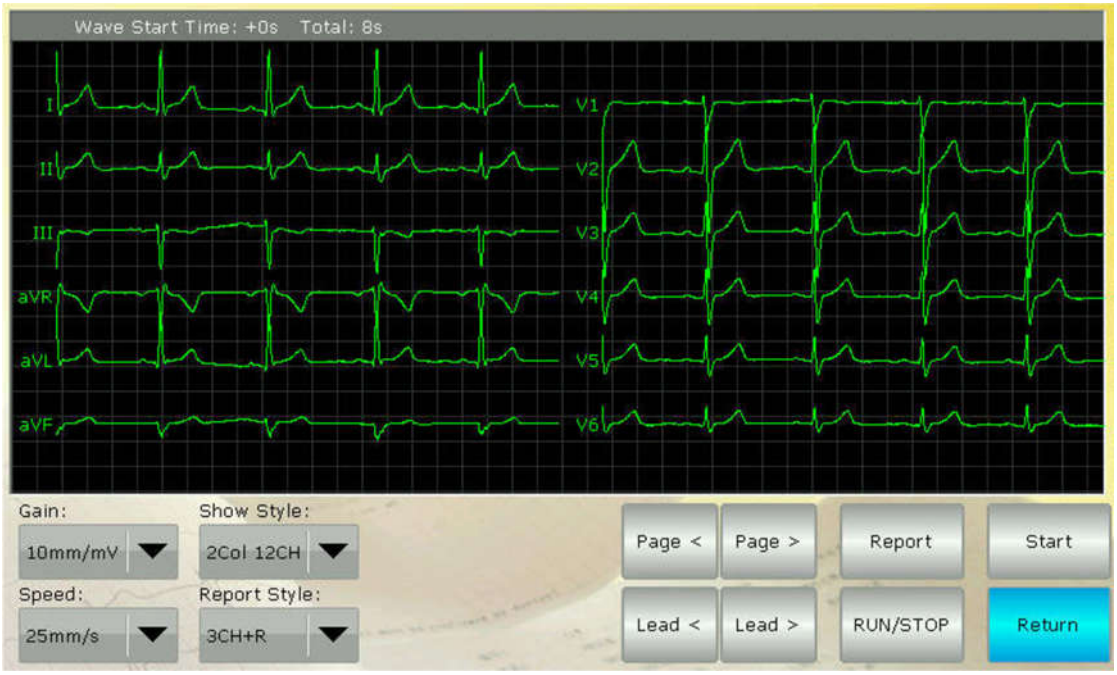


Figure 5-4 The Review Window

Click 

to enter into ECG report window.

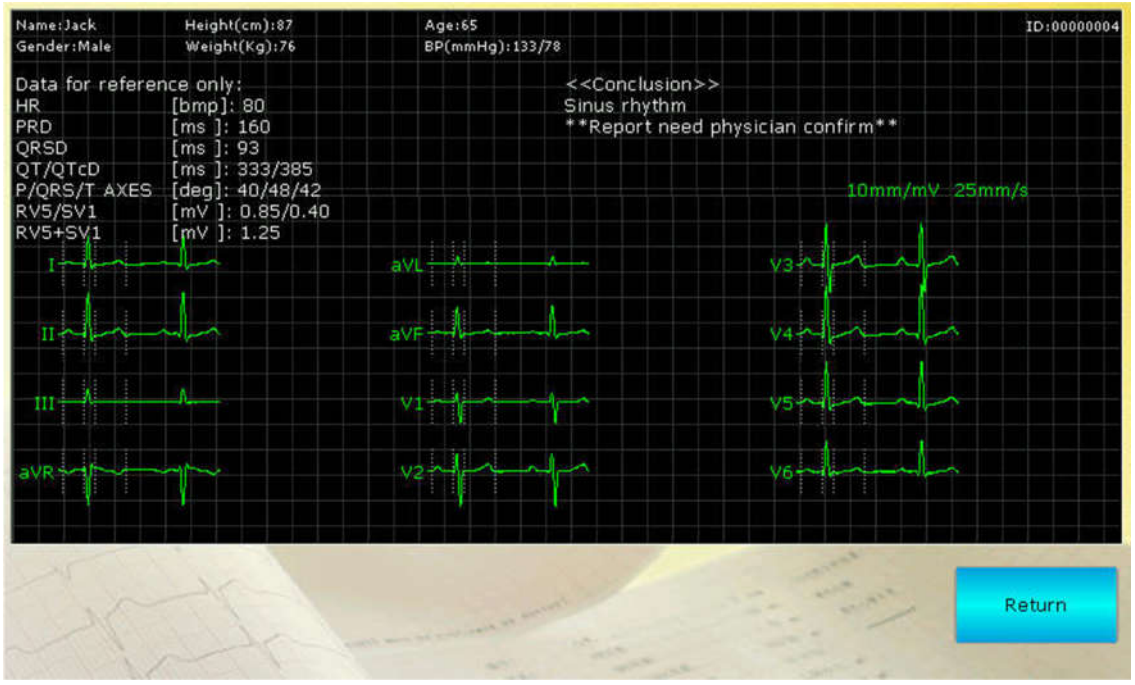


Figure 5-5 The ECG Report Window

5.1.4 Date/Time Setting Window

The following window will be appeared by touching  . You can set the current Date & Time by touching the relevant button.

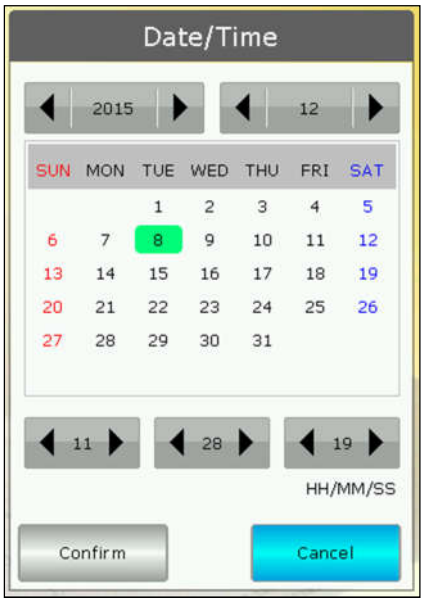


Figure 5-6 Date/Time Setting Window

5.1.5 Setting Window

The following window will be appeared by touching 

.

Figure 5-7 Setting Window

Setup the relevant system parameter.

Setup the relevant sampling parameter.

Setup the relevant analysis parameter.

Setup the relevant printing parameter.

Hospital information.

5.1.5.1 System Setting Window

The following window will be appeared by touching 

.

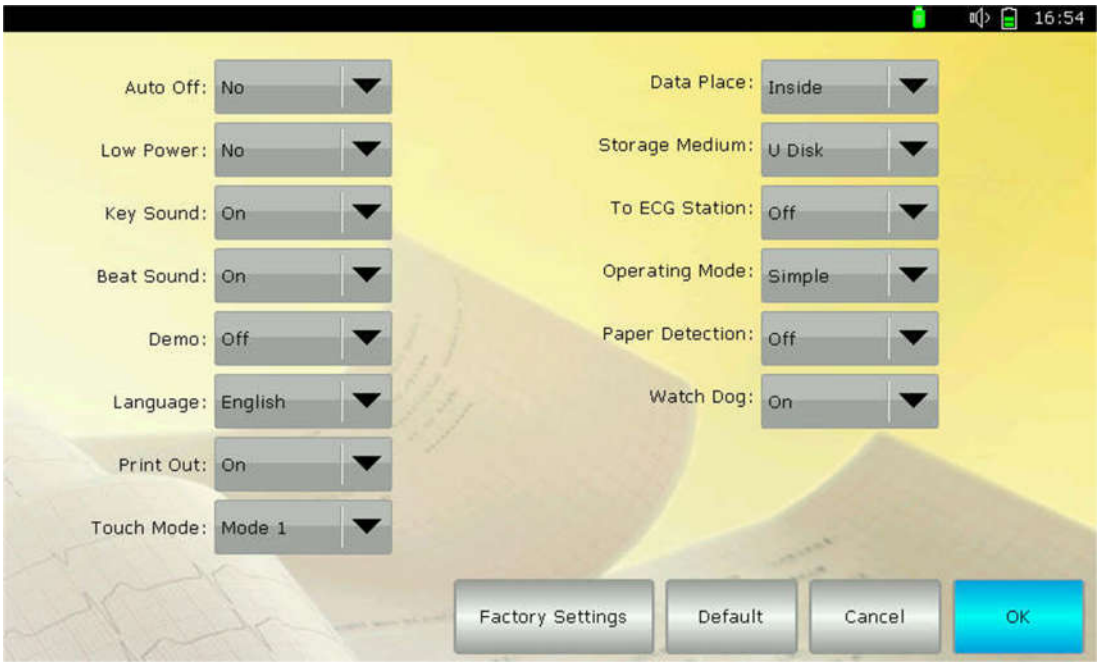


Figure 5-8 System Setting Window

You can change the relevant parameter according to your need.

- Auto Off: Automatic shutdown, option:NO,30sec,1min,3min,5min,7min,10min,30min.
- Screen Saver: Screen Saver, option:NO,30sec,1min,3min,5min,7min,10min,30min.
- Key Sound: option: On, Off.
- Beat Sound: option: On, Off.
- Demo: option: On, Off.
- Language: Language selection.
- Print Out: Printout or not. option: On, Off.
- Data Storage Place: option: None, Inside, Outside.
- Storage Medium Type: option: U disk, SD card.
- To ECG workstation: option: On, Off.
- Operation Mode: option: Normal, Simple.
- Paper Detection: option: On, Off.
- Watch Dog: option: On, Off.
- 

Restore factory settings.
- 

Restore the default value.
- 

Setup is not effective.
- 

Confirm the settings.

5.1.5.2 Sampling Setting Window

The following window will be appeared by touching 

.

Figure 5-9 Sampling Setting Window

You can change the relevant parameter according to your need.

- AC Filter: On or Off
- AC Frequency: 50Hz or 60Hz
- EMG Filter: On or Off
- EMG Frequency: 25Hz, 35Hz or 45Hz
- DF Filter: On or Off
- DF Frequency: 0.05Hz, 0.5Hz or 1Hz
- ECG Cal(%): -50%～+50%
- Show Style: 1CH, 3CH, 3CH+R, 3CH+2, 1col 6CH, 2col 6CH, 12CH
- Show Wave Gain: 5mm/mV, 10mm/mV, 25mm mV
- Show Wave Speed: 2.5mm/s, 25mm/s, 50mm/s
- Anti-Drift: Auto, On, Off
- Signal Out: ---
- Signal Out Cal: ---
- Signal Out Lead: ---
- Signal In: ---
- Signal In Cal: ---
- 

Restore the default value.
- 

Setup is not effective.
- 

Confirm the settings.

5.1.5.3 Analysis Setting Window

Figure 5-10 Analysis Setting Window

- Rhythm Lead: I, II, III, aVR, aVL, aVF, V1, V2, V3, V4, V5, V6
- Premature: ---
- Pause Time: ---
- Tachycardia: Tachycardia threshold.
- Bradycardia: Bradycardia threshold.

5.1.5.4 Printing Setting Window

The following window will be appeared by touching 

.

Figure 5-11 Printing Setting Window

- Report Style: 3CH, 3CH+R, 3CH+2, 6CH, 6CH+R,12CH, Examination, Rhythm
- Wave Gain: Auto, 5mm/mV, 10mm mV, 25mm/mV
- Wave Speed: 12.5mm/s, 25mm/s, 50mm/s
- Record Time: 4s, 8s, 10s, 12s, 24s, 36s, 60s
- Average QRS: 2*6，2*6+Mark，3*4，3*4+Mark，4*3,4*3+Mark, None
- Auto Diagnose: All, Figure, Hint, None
- Lead Mode: Normal, Europe
- Record Mode: Auto, Hand
- Adjust Baseline: On, Off
- Print Thick: Thick 1, Thick 2, Thick 3, Thick 4, Thick 5, Thick 6, Thick 7
- Print Width: Normal, thin, wide
- Exam Lead 1: I, II, III, aVR, aVL, aVF, V1, V2, V3, V4, V5, V6
- Exam Lead 2: I, II, III, aVR, aVL, aVF, V1, V2, V3, V4, V5, V6
- Exam Lead 3: I, II, III, aVR, aVL, aVF, V1, V2, V3, V4, V5, V6

- Paper Width: 80mm for 3 channel and 50mm for 1 channel ECG.
- 

Restore the default value.
- 

Setup is not effective.
- 

Confirm the settings.

5.1.5.5 Hospital Information

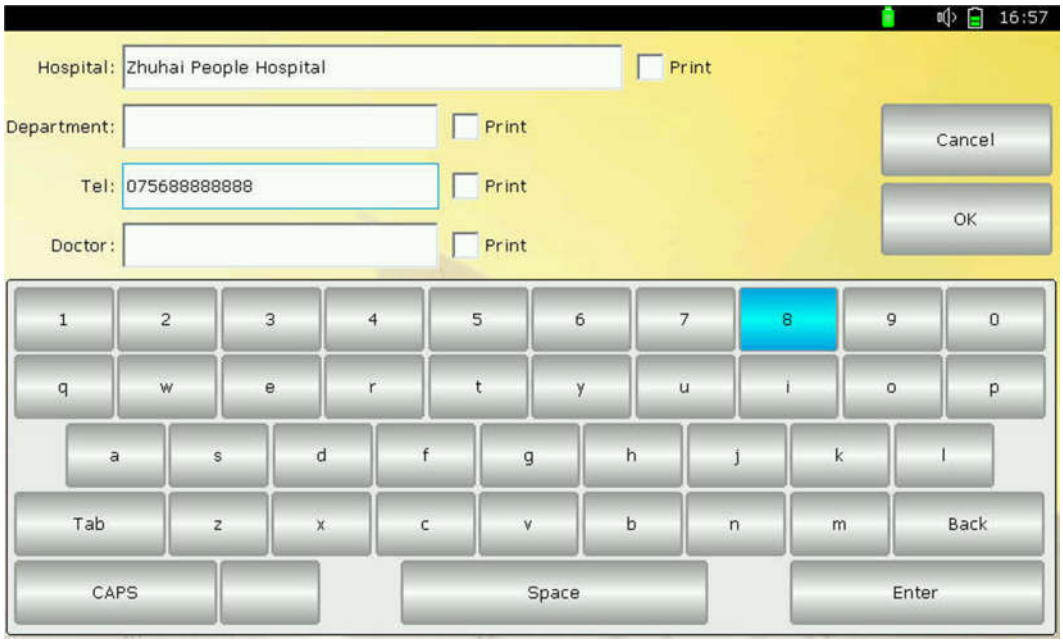


Figure 5-12 Hospital Information Window

You can input hospital name, hospital department, hospital tel. and remark, Select print option for printing.

5.2 ECG Sampling Window

Touch 

to input patient's information, and touch 

to enter into the ECG sampling window as below figure5-11.

- The sampling parameters you set, battery power and the current time will be displayed at the top of ECG waveform.
- The patient's information you input will be displayed at the lower left corner.
- 

Record/Review tow minutes ECG wave.
- 

Return to the navigation window.
- 

Print or stop printing ECG report.

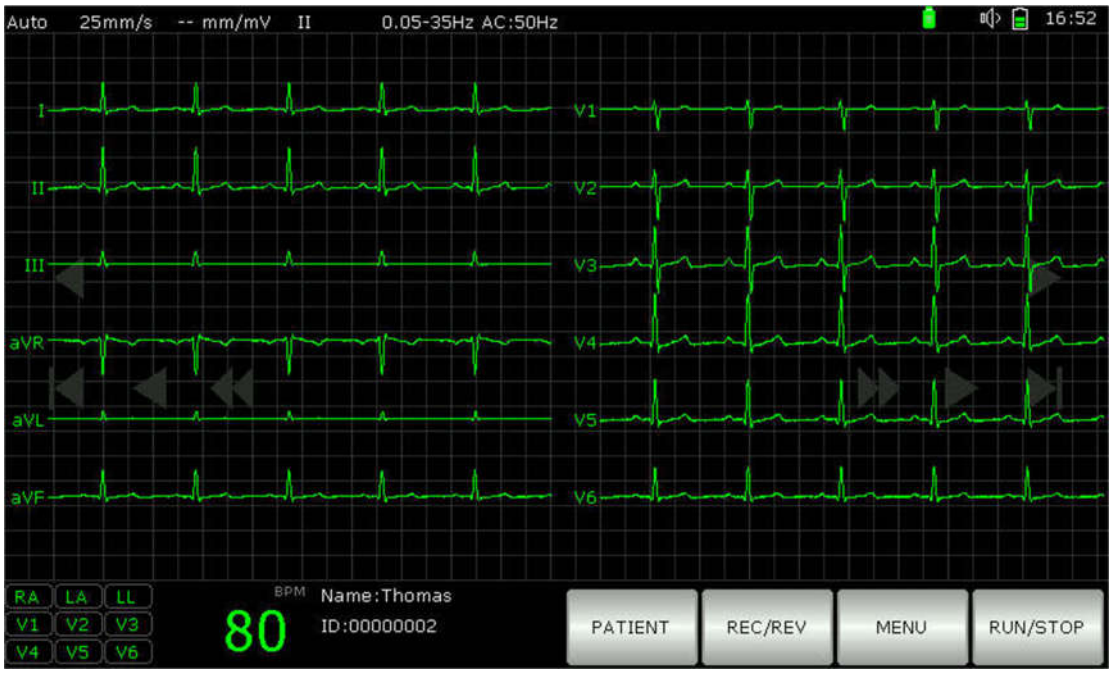


Figure 5-13 ECG Sampling Window

Click  to enter into ECG wave record/review window.

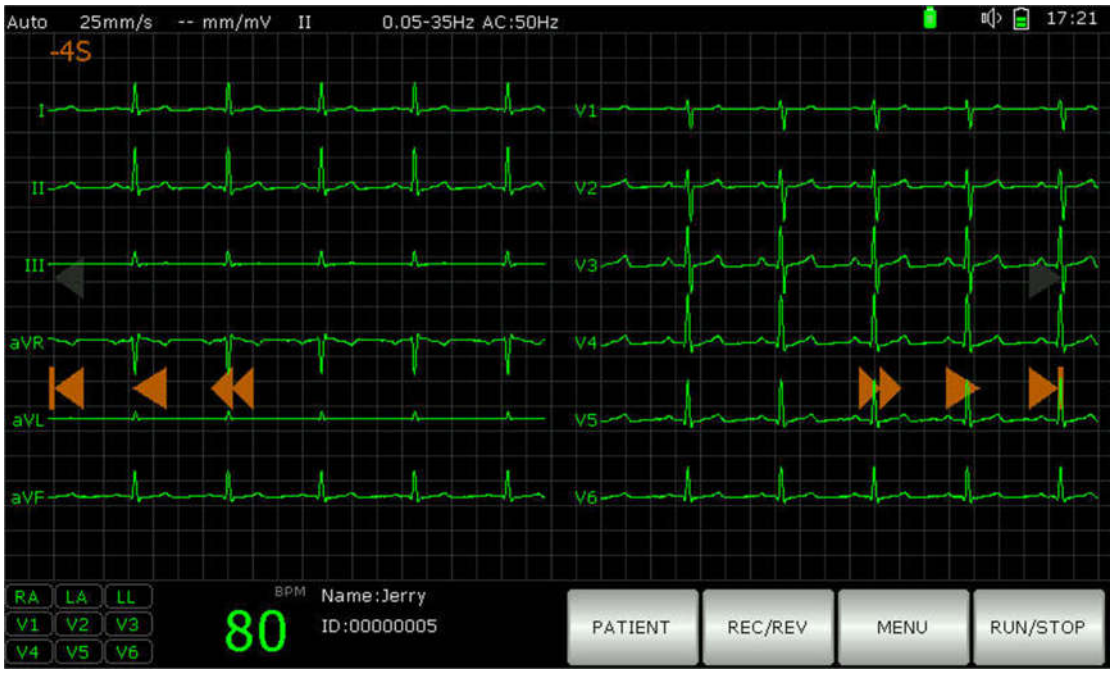


Figure 5-14 ECG Wave REC/REV Window

This ECG machine can freeze 2 minutes ECG wave, Click  to record/review ECG wave. Click “|<”,”<”,”<<”,”>>”,”>”,”>|”, you can select and print ECG wave you need.

Chapter 6 Troubleshooting

6.1 Turn off automatically

- Please check whether the power of battery is used up. Over discharge control circuit of the battery acts.
- Please check whether the alternating current voltage is too high. Over voltage control circuit acts.
- Please check whether the alternating current disturbs is too high, whether the fix knob of lead plug is too tight. Shut automatically is for protecting circuit when overload.

6.2 AC interference

Figure 6-1

- Is the ECG device ground cable proper?
- Are the electrodes and leads connected properly?
- Is the electrode and skin covered with enough Gel?
- Is the metal bed grounding proper?
- Does the patient touch the wall or metal sickbed?
- Does other person touch the patient?
- Whether there is powerful electric device working beside ECG device? For example: X radial device or B-Ultrasound devices.

6.3 EMG interference

Figure 6-2

- Whether the patient room is comfortable.
- Is the patient nervous?
- Is the sickbed too narrow?
- The power line and lead is not parallel or too close.

6.4 Baseline drift

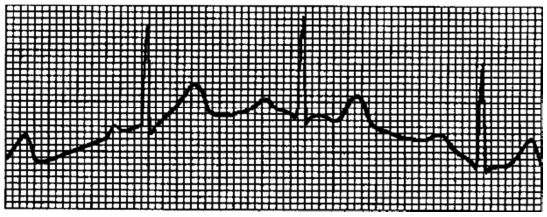


Figure 6-3

- Verify the electrode attachment and lead wire performance.
- Check the connection between patient cable and electrodes.
- Check the cleaning of electrode and patient skin. Is the electrode and skin covered with enough Gel?
- Keep the patient from motion or hyperventilation.
- Is the connection between lead and electrode proper?
- Please use filter if still having above-mentioned interference.

6.5 Troubleshooting List

Phenomenon	Reason	Resolve method
Disturbance too big, the waveform is in disorder	1. Whether the ground cable proper. 2. The connection of leads is not stable. 3. Whether there is disturbance from alternating current.	1. Please check the lead, ground cable and power supply. 2. Please dispose the patient in proper state.
	4.Patient is nervous	
Baseline is rough	1. Disturbance from alternating current is too fierce.	1.Change a comfortable environment for patient
	2.Patient is nervous and the disturbance of EMG too strong	2.If the sickbed is metal, please change it 3. The power line and lead is not parallel or too close.
Wave form is not regular, with too great wave or beeline	1. The conductivity of electrode is not well.	1. Use alcohol of high quality.
	2.Power of battery is used up 3. Contact between electrode and skin is not proper.	2. Clean the electrode and patient's skin where touch the electrode. 3. Charge the battery
	4. The plug between lead and main unit is not tight.	
	5. The contact between lead and electrode is not proper.	
Baseline drift	1.Power of battery is used up	1.Charge the battery
	2.Patient is moving	2.Keep patient hold still
Waveform is not clear.	1.The printer head is dirty 2.The paper is not right	1. Clean the printer head with alcohol when the power is off use the printer head after the alcohol is volatile.
		2. Use the appointed thermal print paper.

Chapter 7 Maintenance Regulation

8.1 Under the condition of normal use according to the user manual and operation notice, if this instrument has any problem, please contact with our customer service department. Our company has the sales record and customer archives for each instrument. The customer has one year's warranty service from the beginning of shipping date according to the below time and condition.

8.2 Our company may adopt the ways of instruction, mailing to company by courier, visiting customers' company, etc to carry out the maintenance promise.

8.3 Even in the period of free maintenance, we charge for reparation in the following archives:

8.3.1 Faults or damnification caused by misuse because not operate according to user manual and operation notice.

8.3.2 Faults or damnification caused by dropping accidently when users move after purchasing.

8.3.3 Faults or damnification caused by preparation, reconstruction, decomposition, etc outside of our company.

8.3.4 Faults or damnification caused by natural disasters such as fire, flood, earthquake, etc.

8.3.5 Faults or damnification caused by unapt thermal recording paper.

8.4 The free maintenance period for spare parts and fray parts is three months. Power cable, recording paper, operation manual and packing material are excluded.

8.5 Our company is not responsible for the faults of other connecting instruments cause by the faults of this device directly or indirectly.

8.6 The free maintenance service will be canceled if we find the protection label has been destroyed.

8.7 For charge maintenance beyond the warranty period, our company advises to continue to use "Maintenance contract regulation". Please consult our customer service department for specific situation.