



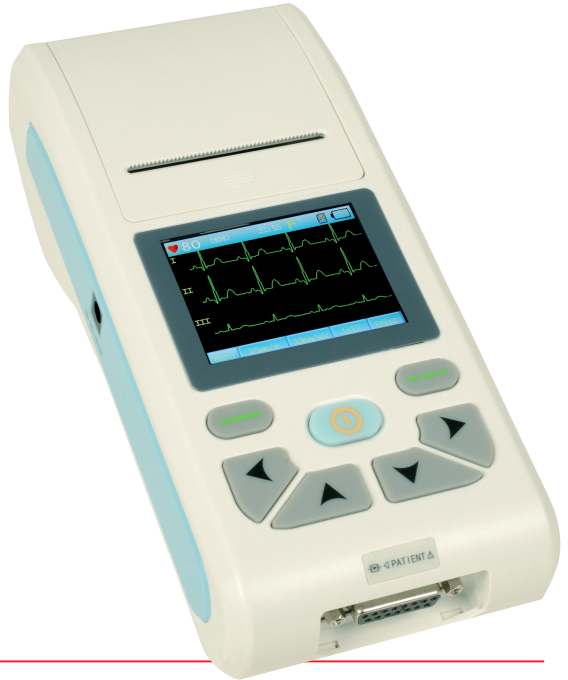
GIMA

PROFESSIONAL MEDICAL PRODUCTS

Gima S.p.A.
Via Marconi, 1 - 20060 Gessate (MI) Italy
gima@gimaitaly.com - export@gimaitaly.com
www.gimaitaly.com

CARDIPOCKET ECG - 3 CANALI **CARDIPOCKET ECG - 3 CHANNELS** **CARDIPOCKET ECG - 3 PISTES** **CARDIPOCKET ECG - 3 CANALES**

Manuale utente - User manual
Notice d'utilisation - Manual de uso



ATTENZIONE: Gli operatori devono leggere e capire completamente questo manuale prima di utilizzare il prodotto.

ATTENTION: The operators must carefully read and completely understand the present manual before using the product.

AVIS: Les opérateurs doivent lire et bien comprendre ce manuel avant d'utiliser le produit.

ATENCIÓN: Los operadores tienen que leer y entender completamente este manual antes de utilizar el producto.

REF 33232 / ECG90A



CONTEC MEDICAL SYSTEMS CO., LTD
No.112 Qinhuang West Street, Economic & Technical
Development Zone, Qinhuangdao, Hebei Province,
PEOPLE'S REPUBLIC OF CHINA
Made in China

EC REP

Shanghai International Holding Corp. GmbH (Europe)
Eiffestrasse 80, 20537 Hamburg, Germany

Importatore / Importer / Importateur / Importador
Gima S.p.A. - Via Marconi, 1
20060 Gessate (MI) Italy



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Chapter 1

MAIN TECHNICAL SPECIFICATIONS

1.1 Environment conditions

Operation

- a) Environment temperature: +5°C~+40°C
- b) Relative humidity: ≤80%
- c) Power supply: 12V adapter
7.4V, 2000mAh rechargeable lithium battery
- d) Atmospheric pressure: 700hPa~1060hPa

Transportation and Storage

- a) Environment temperature: -40°C~55°C
- b) Relative humidity: ≤95%
- c) Atmospheric pressure: 500hPa~1060hPa

1.2 Input way: Floating and defibrillation protection

1.3 Lead: Standard 12 leads

1.4 Patient leak current: <10μA

1.5 Input impedance: ≥50MΩ

1.6 Frequency response: 0.05Hz~150Hz (-3dB~0.4dB)

1.7 Time constant: >3.2s

1.8 CMRR: >60dB, >100dB (Adding filter)

1.9 EMG interference filter: 25Hz or 35Hz (-3dB)

1.10 Recording way: Thermal printing system

1.11 Specification of recording paper:

50mm (W)×20m(L) high-speed thermal paper

1.12 Paper speed:

Auto record: 6.25mm/s, 12.5mm/s, 25mm/s, 50mm/s, error: ±5%

Manual record: 6.25mm/s, 12.5mm/s, 25mm/s, 50mm/s, error: ±5%

1.13 Sensitivity selections:

2.5-5-10-20mm/mV, error: ±5%.

Standard sensitivity is 10mm/mV±0.2mm/mV

1.14 Auto record:

Record setup according to auto record format and mode, automatically changing leads, measuring and analysing.

1.15 Manual record:

Record setup according to manual record format, manually changing leads.

1.16 Measurement parameters:

HR, P-R interval, P Duration, QRS Duration, T Duration, Q-T interval, Q-Tc, P Axis, QRS Axis, T Axis, R(V5), S(V1), R(V5)+S(V1).

1.17 Product safety type:

Class I CF applied part with defibrillation protection.

1.18 Enduring polarization voltage: ±300mV

1.19 Noise level: ≤15μVp-p

1.20 Size: 207mm(L)×96mm(W)×62mm(H)

1.21 Net Weight: 0.5Kg

1.22 Fuse Specification: 2 pcs MSF 002 (2 A/250 V), Power adapter

Chapter 2

SAFETY NOTES

- 2.1** The power supply should be grounded properly before operation.
- 2.2** If there are any questions for the integrality of protective grounding cable, the device must be run with built-in power supply.
- 2.3** This device must be operated by medical staff trained technically and professionally, preserved by special person.
- 2.4** The operator must read this instruction manual carefully before operation, and operate the device according to operation regulations strictly.
- 2.5** The design of this device has mature consideration of security, but operator should never neglect attention to device status and patient's observation.
- 2.6** Please turn off the device and pull out power supply plug before cleaning and disinfection.
- 2.7** Please don't use this device in the presence of flammable anaesthesia gas.
- 2.8** This device can act on heart directly.
- 2.9** Don't rub the screen with edge tools or sharp materials.
- 2.10** If this device is used with cardiac defibrillator or other electric stimulating devices at the same time, please choose Ag/AgCl chloride chest electrode and ECG lead cables with defibrillation function. To prevent the metal electrode from burning patients' skin, the disposable chest electrode should be used if the defibrillation time is over 5 seconds.
- It is better not to use this device with other electric stimulating devices at the same time. If it is necessary, there must be professional technician guiding on the scene.
- 2.11** When connected with this ECG device, others must be Type I equipment complied with GB9706.1-2007. Because the total leakage current may injure patient, the monitoring of leakage current shall be carried out and taken charge by the connected devices.
- 2.12** Notes concerning ECG waveform measurement and analysis
- P wave and Q wave identification are not always reliable with intensive EMG or AC interference. Neither are the ST segment and T wave with baseline drift.
 - Winding and unclear end position of S wave and T wave may cause error in measurement.
 - When R wave is uninspected caused by some leads off or QRS wave low voltage, the heart rate measurement may deviate greatly from the correct.
 - In case of QRS low voltage, ECG axis calculation and border-point identify of QRS wave are not always reliable.
 - Occasionally, frequent ventricular premature complexes may be identified as dominant beat.
 - Merging of versatile arrhythmias may result in unreliable measurement because of the difficulty in distinguishing P wave in such situation.
 - This device is designed with auto analysis function, which only analyses the ECG waveforms it gathers and does not reflect all patient's states.
- Its analysis results may be not in accordance with doctor's diagnoses. Therefore, the final conclusion concerning each patient is up to the doctor basing on analysis results, patient symptoms, and other examinations together.
- 2.13** Please don't use this device in the presence of high-power equipment interference. Please keep the device away from emission source such as handset or portable telephone, etc.

Chapter 3

WARRANTY REGULATION

- 3.1** In normal use, under strict observance of user manual and operation notes, in case of failure, please contact with our customer service department. Our company has the sales record and customer archives for each device. The customer has one year's warranty service from the date of shipping according to the following conditions. To supply all-around and quick maintenance service for you, please mail the maintenance card to us in time.
- 3.2** Our company may adopt such ways as guidance, express to company or calling in, etc to carry out warranty promise.
- 3.3** Even in warranty period, the following repairs are charged in principle:
- Faults or injuries caused by misuse not according to user manual and operation notes.
 - Faults or injuries caused by dropping accidentally when moving after purchasing.
 - Faults or injuries caused by repair, reconstruction, decomposition, etc. not in our company.
 - Faults or injuries caused by natural disasters such as fire, flood, earthquake, etc.
 - Faults or injuries caused by improper thermal recording paper.
- 3.4** The warranty period for accessories and fray parts is half a year. Power cable, recording paper, operation manual and packing material are excluded.
- 3.5** Our company is not responsible for the faults of other connected devices caused by the faults of this device directly or indirectly.
- 3.6** The warranty will be canceled if we find the protection label has been destroyed.
- 3.7** For charged maintenance beyond warranty period, our company advises to continue using "Maintenance contract regulation". Please refer to our customer service department for details.
- 3.8** The below method should be adopted in the process of device mounting or storage:
- Select a room with complete infrastructure.
 - Set the device on a flat level worktable. Avoid too strong vibration or impact when moving it.
 - A perfect power system and grounding is need in room, otherwise, it may hurt patient.
 - If there are any questions for the integrality of protective grounding cable, the device must be run with built-in power supply.
 - Both AC frequency and voltage should accord with the requirement, and current capability is enough.
 - The AC power lines should have 3 cores, otherwise the shock hazard to the patient or operator may be caused.
 - Keep device from water, don't use or store it in the place with the air pressure, humidity or temperature over the standard, bad ventilation, the air with sourness, salt, alkali, chemical medicine or too much dust, or the danger of airleak.
 - There should be no high-power device, such as high voltage cable, X-ray or ultrasound device or electrotherapeutical device.
 - If this device is used with cardiac defibrillator or other electric stimulating devices at the same time, please choose Ag/AgCl chest electrodes.

- If the defibrillation time is over 5 seconds, the one-off chest electrode should be used to prevent the metal electrode from burning patients' skin. It is better not to use this device with other electric stimulating devices simultaneously. If it is necessary, there must be professional technician guiding on the scene.
- In the process of device operation, doctor should be in the operating place all the time and observe the patient carefully. Cut off the power or take off the electrode when necessary to ensure patient's security.
- After operation, turn all of the function state back to the original state before turning off. Take off the electrode gently without forcible pulling. Clean device and all accessories for the next use.
- With over loading, amplifier saturation or lead off, device can prompt working failure.
- The device and all accessories should be performed maintenance and overhaul termly (the period should be no longer than half a year).
- Electrocardiograph is a kind of measuring device, should be send to the related department to test termly following local regulation. The test cycle should not be more than 1 year.

Chapter 4

PRODUCT MAIN CHARACTERISTICS

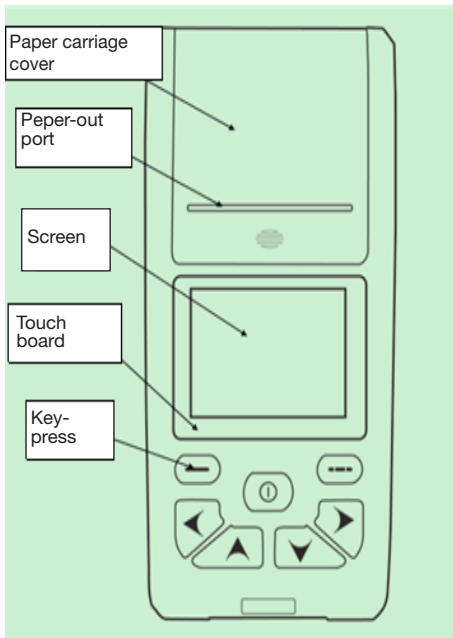
- 4.1** High resolution thermal-array output system (8 dots/mm), needs no adjustment. Frequency Response is up to 150Hz.
- 4.2** Record clear and exact three channels of ECG waveforms and remark real-time and continuously. The remark includes: lead sign, sensitivity, paper speed, filter state, etc.
- 4.3** In auto mode, one button operation to complete record, which will improve work efficiency.
- 4.4** Key-press and touch-screen control, more convenient for operation. TFT screen shows the working status, more clear for observation.
- 4.5** Safety Class: Class I, Type CF applied part with defibrillation protection.
- 4.6** The power supply includes both AC and DC. This device includes built-in lithium polymer rechargeable battery.
If use power adapter for charging, about 4 hours is enough.
- 4.7** This instrument can record 450 pieces of ECG waveform and print for 4 hours continually under the best DC state.
- 4.8** This device can print or store different time length of case to convenient for doctor's case review and statistics.
- 4.9** You can select print mode, print length, gain, paper speed and report print selection.
- 4.10** You can select whether to set patient information and to save case when printing.
- 4.11** You can replay the stored case and patient information anytime.
- 4.12** Exterior SD card, convenient for use. With SD card, the device can store 100 case most.
- 4.13** With USB2.0 port, working mode can be selected freely between store and synchronization.
- 4.14** In the process of use, there are clear prompts (such as paper-lack, SD card operating error, etc.) for misoperation, which is convenient for users' operation.

- 4.15 Digital signal processing, to obtain the ECG of higher quality by AC, DFT and EMG filter.
- 4.16 Auto-measurement, auto-analyse and auto-diagnosis of regular ECG parameter, reduce doctor's burden and improve working efficiency.
- 4.17 The figure of whole device is elegant, gliding, smart and portable, the weight of device is less than 1kg.
- 4.18 Classification according to the defense degree of deleterious fluid: IPX0.
- 4.19 Classification according to the safe degree of the device used under the condition with flammable anaesthesia gas mixed with air (or oxygen, nitrous oxide): unsuited to use.
- 4.20 Working mode classification: continuous working device.

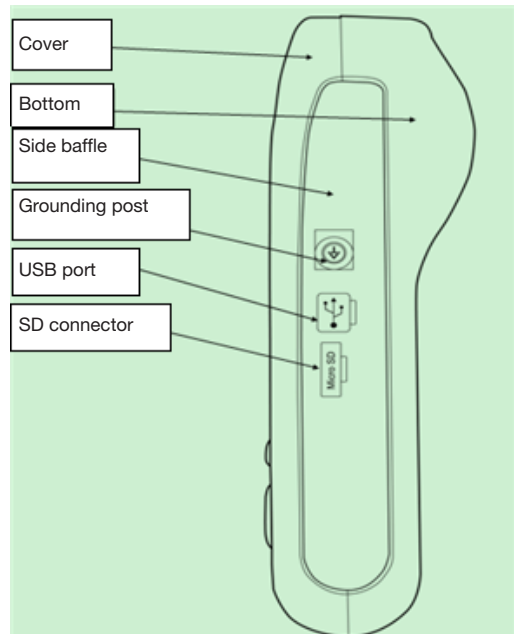
Chapter 5

PANEL SKETCH MAP

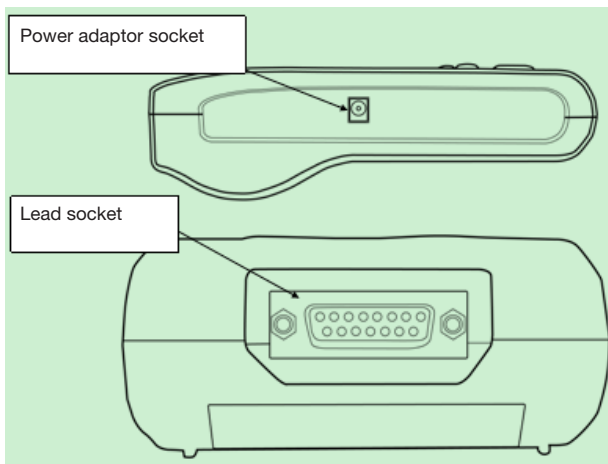
5.1 Each panel view and its components



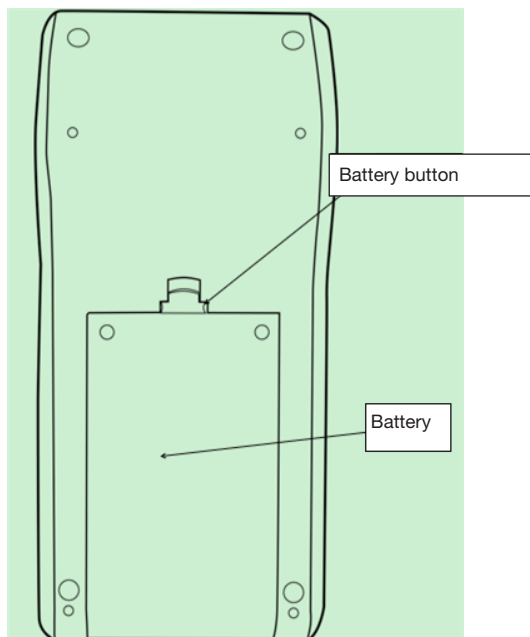
Front view



Side view



Side view



Bottom view

5.2 Key Definition



Function key: Menu/Confirm



Function key: Back/Print



Function key: Power on/Power off/
Lead number switch/Confirm



Direction key: up



Direction key: down



Direction key: left



Direction key: right

Chapter 6

NOTES BEFORE OPERATING

6.1 Cautions before use

- 6.1.1 To ensure the safety and effectiveness, please read the user manual carefully before use.
- 6.1.2 The device should be in serviceable condition.
- 6.1.3 Place the device on a flat surface, be careful when portage, and avoid strong vibration and shock.
- 6.1.4 Make sure all lead cables are connected correctly and the device has been grounded.
- 6.1.5 The frequency and voltage values of AC power supply shall be in accordance with the requirements, enough current capacity shall be guaranteed.
- 6.1.6 When using battery as power supply, please check the battery voltage and its status to ensure enough battery capacity.
- 6.1.7 If the device is cooperated with other devices for use, to protect the patient and operators, all devices should be equipotential grounded.
- 6.1.8 Install the device at a indoor place that easy for grounding. Do not let the patient and connection cables on the patient in contact with any conductors, including ground and grounded sickbed.

- 6.1.9** Use the neutral solvent to clean lead cables, do not use any detergent or germicide containing alcohol.
- 6.1.10** Please make sure the temperature of operating environment is within +5°C ~+40°C. If the device is stored in relative high/low temperature, place it in the operating environment for about 10 minutes before use, in order to achieve normal performance.
- 6.2 Cautions during operating**
- 6.2.1** For the ECG waveform printing, it shall be started after the waveform is stable. Do not touch the printer during printing process.
- 6.2.2** Doctors should not leave when operating the device. To ensure patient safety, doctors shall keep observing the patient, shutdown the power or remove the electrodes if necessary.
- 6.2.3** The patient can connect with the device only by electrodes of lead cables, and avoid touching with other parts or conductors on device.
- 6.2.4** Patient shall not move when the device is running.
- 6.3 Cautions after use**
- 6.3.1** Set all the functions as initial state, then shutdown the device.
- 6.3.2** Cut the power off, gently remove the electrodes and limb clips, then take away the lead cables, do not pull the cables with force.
- 6.3.3** Clean the device and its accessories, store it in proper place for further use.

Chapter 7

PREPARATIONS BEFORE OPERATION

- 7.1** Check whether the instrument is grounded properly and cable connection is safe or not.
- 7.2** Make sure all electrodes connected directly with patient are proper and firm.
- 7.3** The conductive gel cost should be separate with each other, and it is same for chest electrodes, in order to avoid the short circuit.
- 7.4** AC power cable can not be enlaced with ECG cable.
- 7.5** Don't use water pipe or other pipes as earth line. Fine grounding can not only ensure safety, but also reduce AC interference and other electromagnetic interference.

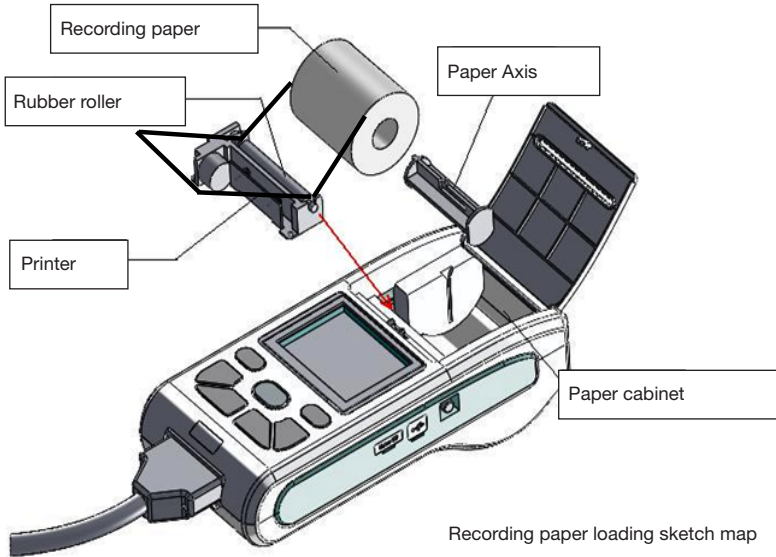
Chapter 8

NOTES DURING OPERATION

- 8.1** Pay attention to the patient and device status at any moment.
- 8.2** Patient and device can only be connected through ECG lead cables.
- 8.3** Keep close observation of the patient and device to make sure they are still during operation.
- 8.4** Turn off the device after using.
- 8.5** Disconnect the power, and remove the ECG lead cables gently without strong force.

8.6 Keep the device and its accessories properly for operation next time.

8.7 Recording Paper Loading.

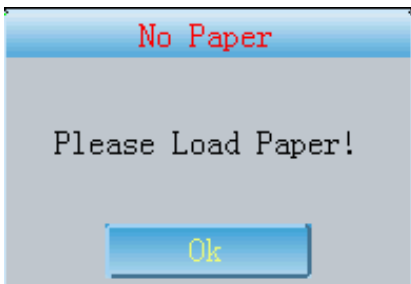


- The device adopts high-speed thermal recording paper with the specification of 50mm(W)×20m(L).
- Open the cover of paper carriage, take out the paper roll and install it into recording paper then load them at the proper position inside the carriage.
- Close the cover of paper carriage. It's recommended to leave 2cm paper outside.

Chapter 9

INSTRUCTION OF RECORDING PAPER

9.1 When recording, the device will stop paper trace in case of paper lack, and the LCD screen will display as the figure below to prompt paper lack.



- 9.2** It is recommended to use the thermal recording paper specified by our company to ensure ECG waveforms of good effect. Bad recording paper will result in unclear ECG waveforms, fading or unsmooth paper trace, etc, even pricking up the device's worn up and shortening the service cycle of such important components as printer head. Please consult your manufacture or our company for purchasing this recording paper.
- 9.3** High temperature, humidity or direct sunniness may all be the causes for recording paper failure. The paper, which will not be used for long, shall be stored in a cool, dry and dark place.
- 9.4** Substance may contaminate surface of the recording paper:
Gel, glue, and half-dry diazo compound copy paper, etc, including their organic solvent.
- 9.5** Substance may cause the waveforms to disappear:
Soft PVC folders, plastic, etc; demagnetization machine and tape containing plasticizer;
Some fluorescence ink pen and stamp-pad ink, etc.

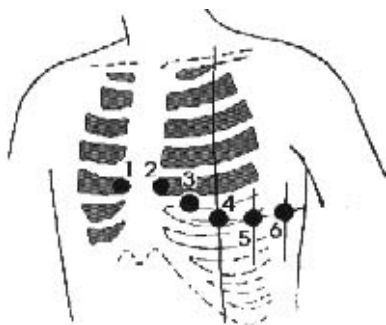
Chapter 10

ELECTRODE PLACEMENT

Advice: Set the chest electrode first, then the limb electrode.

10.1 Chest Electrode Placement

See the figure below.



Attach the chest electrodes to the locations as following:

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

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

V3: Midway between V2 and V4.

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

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

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

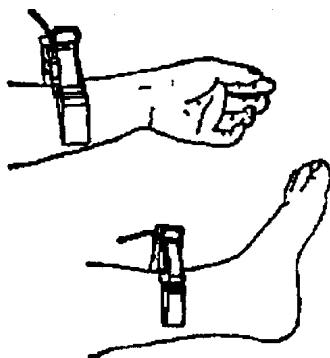
Clean the skin where chest electrodes are to be attached with alcohol, then apply ECG cream to here around 25mm in diameter and to the edge of chest electrodes, then press and attach the electrodes to the positions from V1-V6.



Note: Keep in mind that the electrodes' coming into contact with each other or cream's overlap from one position to another is not allowed to avoid short circuit.

10.2 Limb Electrode Attachment

Electrodes should be placed on the soft skin of hands and feet. At first, clean the positions where limb electrodes are to be attached with alcohol, then applying conductive cream to them.



Note: Screw tightly the knob of ECG cable's plug after it is inserted to the ECG connector.

10.3 Check-List for Electrodes and ECG cables

Electrode Location	Electrode Symbol	Plug No.
Right Arm	RA/R	9
Left Arm	LA/L	10
Left Leg	LL/F	11
Right Leg	RL/N	14
Chest 1	VI/CI	12
Chest 2	V2/C2	1
Chest 3	V3/C3	2
Chest 4	V4/C4	3
Chest 5	V5/C5	4
Chest 6	V6/C6	5

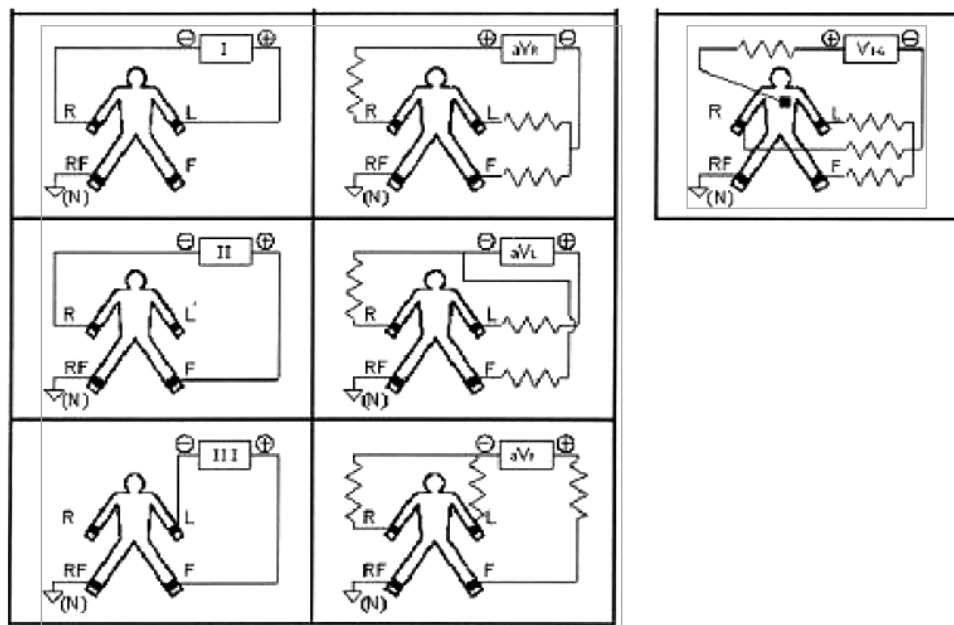
Cautions:

Do not turn on the device when installing lead cables.

If the ECG waveform for a long time does not appear, please check whether the electrodes good contact with the skin.

Smear electrodes with conductive paste before installation.

10.4 ECG Lead Systems



Chapter 11

CLEANING AND DISINFECTION






11.1 Notice

- 1 Please power off the equipment and take off the power line and lead lines before cleaning equipment.
- 2 During cleaning, never let liquid into the equipment interior. At any events, don't immerse equipment or lead lines into the liquid.
- 3 Don't use wearing material to clean, in order to avoid electrode damage.
- 4 Don't leave the cleaning agents on the surface of the equipment or lead lines.
- 5 Don't use high temperature or high pressure vapour or ionizing radiation to disinfect equipment.
- 6 Don't use disinfectant with chlorine, such as bleaching powder, sodium hypochlorite, etc..
- 7 You can use soap liquor or water to clean lead lines and electrodes, use grain alcohol group or acetaldehyde group to sterilize and disinfect.

Chapter 12

PRECAUTION FOR BATTERY OPERATION

- 12.1** This instrument is designed with knock-down maintenance-free rechargeable lithium battery, and has perfect automatic charge and discharge monitoring system. The instrument recharges the battery automatically when connected to AC power supply. The LCD screen will show the current power state at the top right corner when the instrument turns on (see 12.4). It needs about 4 hours for battery charge after discharge absolutely.
- 12.2** The device can continuously print for 4 hours after the battery fully charged. When it is working, the LCD screen displays the signal of the battery status in 5 degree. When the power of battery is too low to operate, the instrument will turn off automatically to avoid damage to the battery.
- 12.3** 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.
- 12.4** Six status of the battery power displayed on LCD as following:

No.	Mark	Description
A		Using battery, and full power
B		Using battery, volume : 3/4
C		Using battery, volume: 1/2
D		Using battery, volume : 1/4
E		Using AC power (no battery)
F	A~D cycle display	Charging



Note: When charging, the battery icon shifts from A to D.

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



Attention!!!

- Do not directly connect both “+” and “-” polars of battery with wire, otherwise it might cause fire hazard.
- Do not keep it nearby the ablaze area to avoid the danger of explosion.
- Do not open or disassemble the battery by yourself.
- The AC display status may be abnormal at the state of no battery.

Chapter 13

OPERATING INSTRUCTIONS

13.1 Main Menu

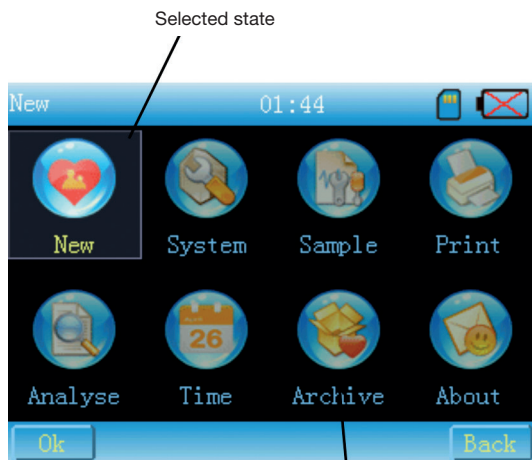


Fig. 13-1-1

Unselected state

Operating instructions

- 1 Enter corresponding setting interface by touch screen.
- 2 Use "Up" "Down" "Left" "Right" to move the focus to the wanted submenu and press confirm key or touch **Ok** to enter corresponding interface.
- 3 Click **Back** or press return key to return the sample interface.

13.2 Sample Interface

The interface is shown as Fig.13-2-1.

Function introduction

This interface shows waveform. You can modify gain, speed, print mode, waveform display mode (3-lead, 6-lead, 12-lead), in addition print, set filter quickly, check sate of SD-card. Operating instructions are as follows:

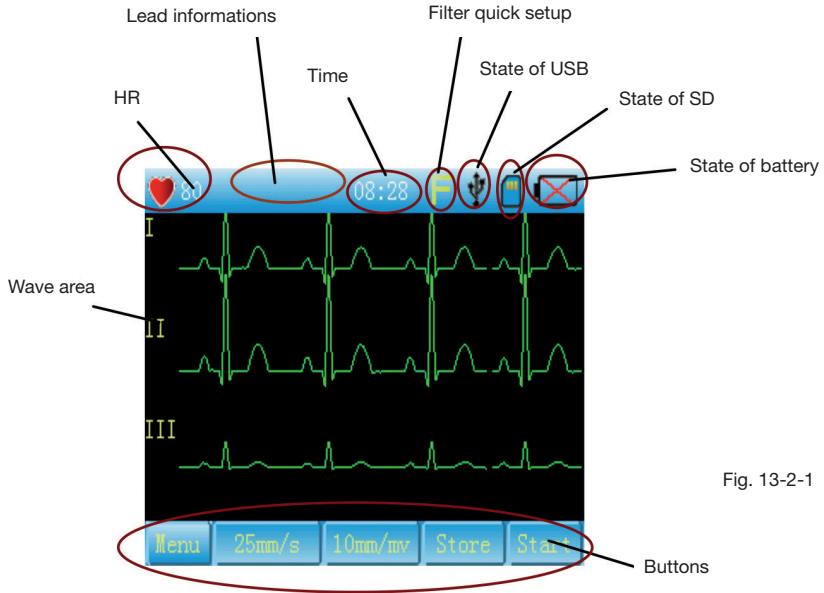
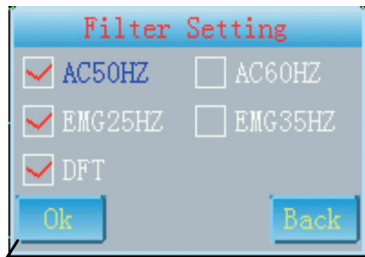


Fig. 13-2-1




Operating instructions

- 1  Enter "Filter Setting" interface as Fig.13-2-2.



3-2-2

Selected state

- 1) You can select AC, EMG or DFT. In two frequency selections of AC or EMG, you can only select one.
 - 2) Click  or [Confirm] key on the panel to save the current settings.
 - 3) Click  or [Confirm] key on the panel to exit without save.
- 2  Click this icon to check the state of SD card, as Fig.13-2-3.

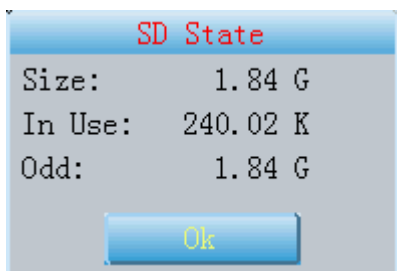


Fig. 13-2-3

3 Click  or press confirm key to exit this interface.

4  Click this icon or the menu key to enter the main menu, as Fig.13-2-4.

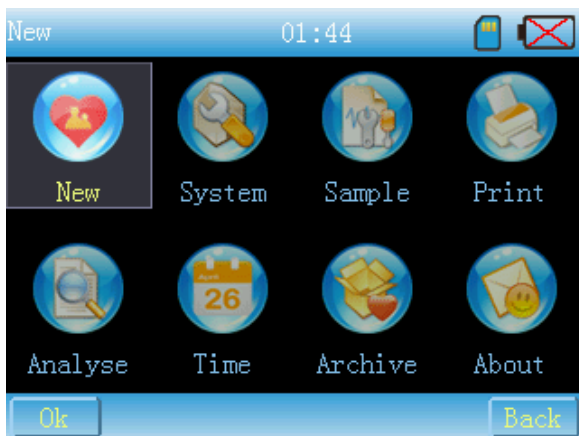






Fig. 13-2-4

5  Click this icon or press "UP" and "DOWN" key on the panel to switch speed.

6  Click this icon or press "UP" and "DOWN" key on the panel to switch gain.

7  Click this icon or press "UP" and "DOWN" key on the panel to switch print mode.

8  Click this icon or press "PRINT" key on the panel to print.



Attention:

Please ensure that there is paper in the paper carriage, otherwise the prompt of paper-lack will appear, as Fig.13-2-5:

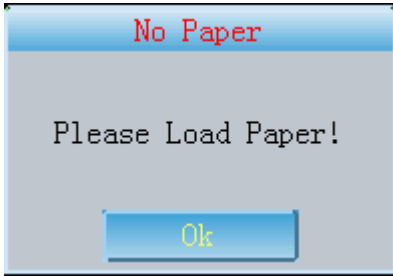


Fig. 13-2-5

Click  and load paper, then print is enabled.

9 Wave display mode switch: glide left and right in the wave area on the screen or press [confirm] key to switch wave display mode as Fig.13-2, Fig.13-2-7.



Fig. 13-2-6

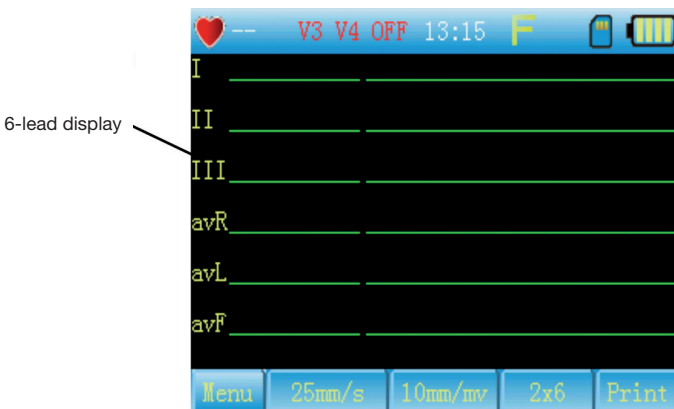


Fig. 13-2-7

10 Lead switch: glide up and down in the wave area on the screen to switch leads.

13.3 System Settings

The interface is showed as Fig.13-3-1, Fig.13-3-2

Function introduction

System settings includes backlight, power alarm, key voice, language, case store, information input, USB-mode, calibrate, etc.

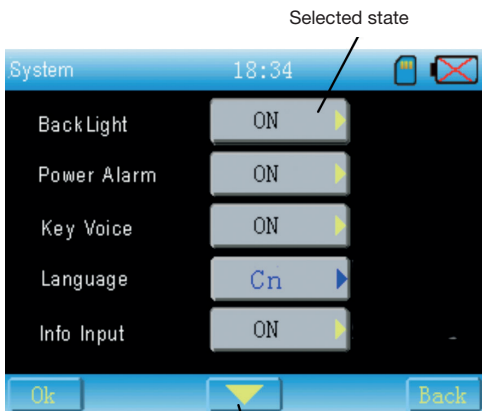


Fig. 13-3-2

Operating instructions

You can touch the corresponding button to enter into the setting interface, where you can select the item you want or move the focus on the wanted item, then press [Con-firm] or [Right] key to call up the setting menu to set.

As Fig.13-3-3

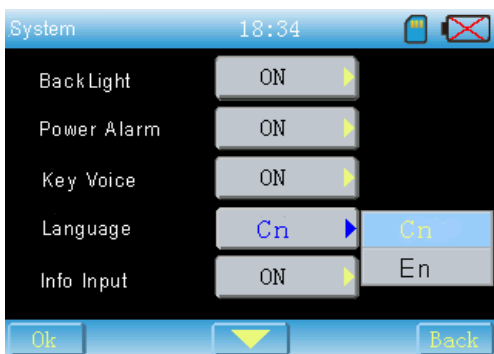






Fig. 13-3-3

- 1 Click   or press [UP] [DOWN] to turn page up and down.
- 2 Click  to save the current settings and exit this interface into the main menu, click  to exit without save.
- 3 BackLight: select "OFF" and confirm it, the back light will close and device will enter the power-save mode. Then press any a key on the panel to open the back light.
- 4 Power alarm: when it is enabled, system can alarm every 10s when the charge of battery is less than 5% without AC power source.
- 5 Key voice: when it is enabled, key can make sound after device is started. Otherwise it is the silence mode.
- 6 Language: can select Chinese or English.
- 7 Info input: when it is enabled, you have to enter the interface "Set Patient" as Fig.13-3-4 before print or save.

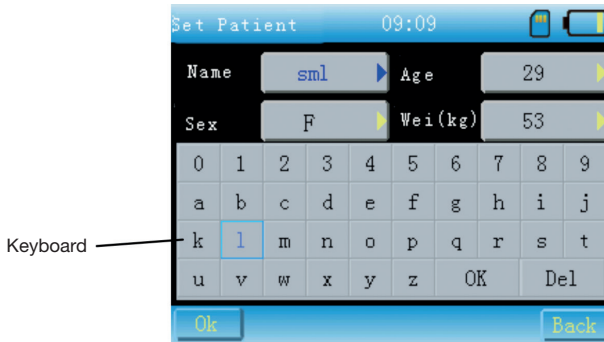






Fig. 13-3-4

- 1) Switch setting information by [UP] [DOWN] on the panel.
- 2) Select the item you want to set, then touch the keyboard on the screen or press [Confirm] on the panel and move focus to the keyboard to set current information. Click  to delete the input. Click  to confirm your setting.
- 3) Click  to save the setting and print. Click  to print without save.

Attention:

- a) you can click directly or press [LEFT] [RIGHT] to set sex without keyboard.
- b) the length of name is no more than 3.
- c) age <200.
- d) weight(kg)<200

8 USB-mode

- 1) This item is disabled when USB is not connected as Fig.13-3-2.
- 2) This item is enabled when USB is connected. "Store" or "Sync" can be selected.

9 Screen Calibrate

Click "Calibrate" to call up the dialog box as Fig.13-3-5

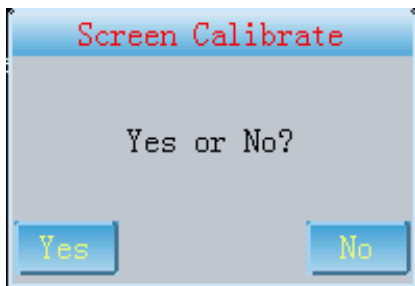


Fig. 13-3-5

Click "Yes" to enter the calibration interface as Fig.13-3-6.

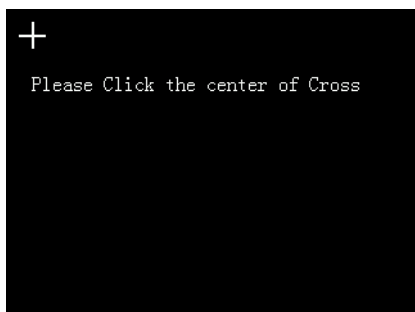


Fig. 13-3-6

Please operate according to the prompt. If calibration is successful, the prompt "Calibrate OK!" will appear. If failed, "Calibrate fail, please again" will appear.

13.4 Sample Setting

The interface is shown as Fig.13-4-1.



Fig. 13-4-1

Function introduction

Sample settings include AC filter, EMG filter, DFT filter and demo mode.

Operating instructions

The operation is same as system setting.

Filter setting can be performed by clicking  on the screen.

13.5 Print Setting

The interface is shown as Fig.13-5-1 and 13-5-2.

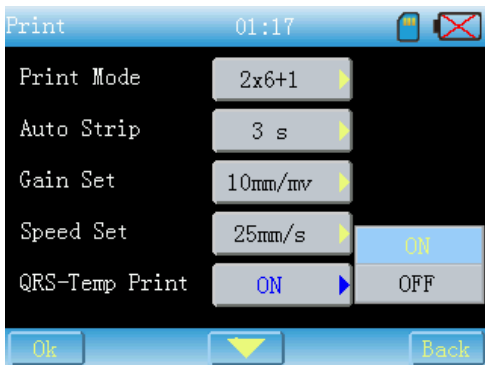


Fig. 13-5-1

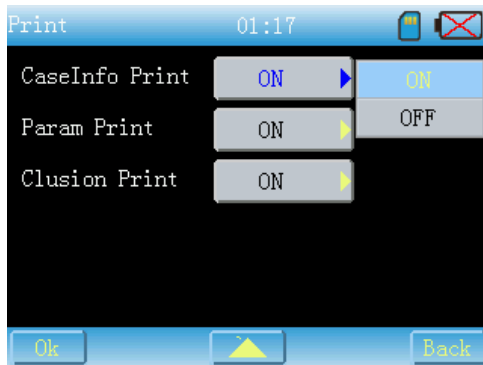


Fig. 13-5-2

Function introduction

Print setting, prepared for print, includes print mode, auto strip, gain set, speed set, report print set (QRS-temp, case information, parameters, conclusion)

Operating instructions

1 Print mode

1x12, 1x12+1, 2x6, 2x6+1, 3x4, manual, store modes including.

The operating instruction of each mode is shown as following:

1x12+1, 2x6+1: rhythm lead print, rhythm lead can be set in analysis setting.

1x12, 2x6, 3x4: automatical print

Manual: in manual mode you can print waveform according to your need without save.

Store: in this mode case can be saved but can't be printed. The interface is shown s Fig.13-5-3

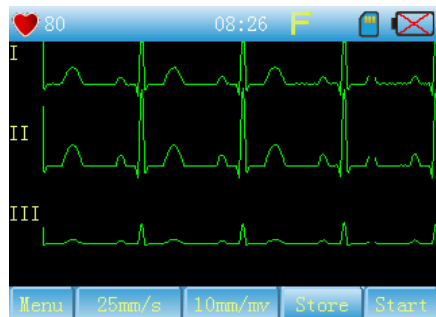


Fig. 13-5-3

Click "Start", system starts to save case. In the process of that, the interface is shown as Fig.13-5-4.

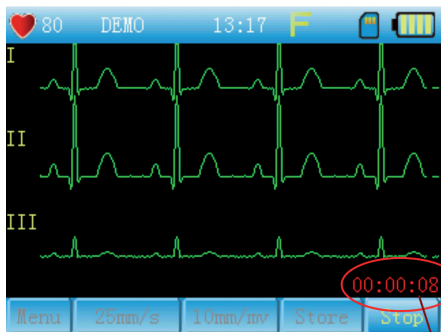


Fig.13-5-4

Store timing

2 Other settings are same as system setting.

⚠ Attention: "Auto strip" is defaulted as 3s and can't be changed when there is no SD card.

13.6 Analysis Setting

The interface is shown as Fig.13-6-1.



Fig. 13-6-1

Function introduction

Here you can set the items about analysis.

Operating instructions

1 Rhythm lead: click button to call up the interface as Fig.13-6-2



Fig. 13-6-2

Please select the lead you wanted by clicking on the keyboard or pressing keys on the panel.

2 Pause Time : click corresponding button to call up the interface as Fig.13-6-3.



Fig. 13-6-3

Input number according to your need. Its operation is same as above.

3 Operating instructions of other items are same as 2.

13.7 Time Setting

The interface is shown as Fig.13-7-1



Fig. 13-7-1

Function introduction

Data and time settings.

Operating instructions

Select the wanted item, and click or to set.

13.8 Archive Management

As Fig.13-8-1 and 13-8-2

ID	Date Time	Name
1	2012-02-15 08:26:37	--
2	2012-02-15 08:19:54	--
3	2012-02-14 11:18:09	--
4	2012-02-14 10:59:02	--
5	2012-02-14 10:58:44	--
6	2012-02-14 10:57:31	--

Fig. 13-8-1

ID	Date Time	Name
7	2012-09-21 13:08:16	--
8	2012-09-21 13:07:59	--
9	2012-09-21 13:07:53	--
10	2012-09-21 13:07:48	--
11	2012-09-21 13:07:42	--
12	2012-09-21 13:07:37	--

Fig. 13-8-2

Function introduction

Here you can look over all of the stored case, and can replay or delete them.

Operating instructions

Click the case directly or press [UP] [DOWN] to examine the case you want.

Gray shows the current page is the first, otherwise it can be clicked to turn the page up.

Gray shows the current page is the last, otherwise it can be clicked to turn the page down.

Replay: click or press [Confirm] on the panel to replay waves.

Its interface is as Fig.13-8-3.

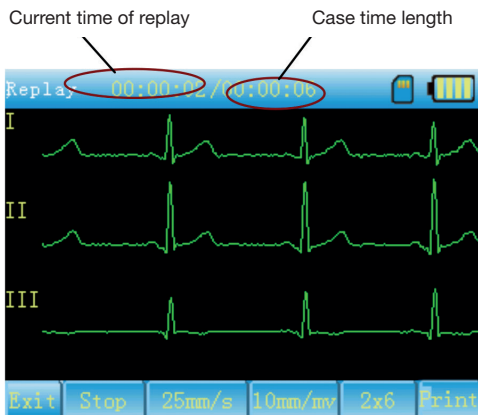


Fig. 13-8-3

Exit : Return "Archive" interface from "Replay" interface.

Stop : Click this button to replay waves statically, as Fig.13-8-4.

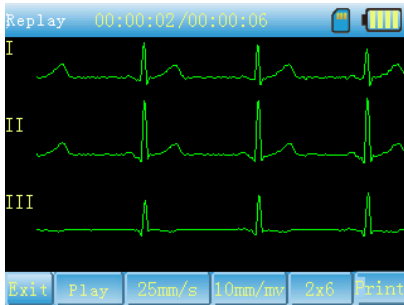


Fig. 13-8-4

You can glide screen left and right to check the waves of different times, and glide screen up and down to check the waves of different leads. Current case print and print setting can be performed. The operations are same as sample interface.

13.9 About

As Fig.13-9-1:

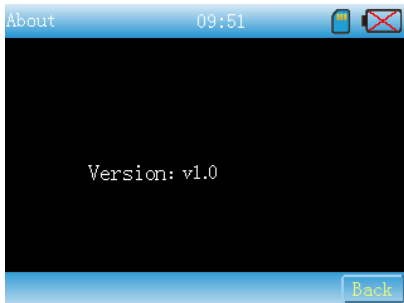


Fig. 13-9-1

13.10 USB Port

Function introduction

USB works in store (MASS) or synchronization (HID) mode. In MASS mode, SD card can be read by PC. In HID mode, you can sample real-time case by synchro analyse software.

13.11 SD Card

Function introduction

SD card is used to store case and upgrade process. In the process of use, SD card may appear some problems, for those, there are different prompts to instruct users to operation.

- 1 When the case is being printed in the 1x12, 1x12+1, 2x6, 2x6+1, 3x4 mode, if there is no SD card, the dialog box as Fig.13-11-1 will appear to prompt users the case can't be stored if print continues.



Fig. 13-11-1

- Click "Yes", print will continue but the case will not be stored. Click "No", print will be canceled, you can insert SD card then continue to print.
- 2 If you select "Only store" mode, when there is no SD card or SD card operating error, the prompt as Fig.13-11-2 will appear to prompt users that store is disabled because of SD card error.



Fig. 13-11-2

- Here click "OK" and insert SD card again, then continue to store case.
- 3 When system enters Archive Management, the prompt as Fig.13-11-3 appears, please insert SD card again.

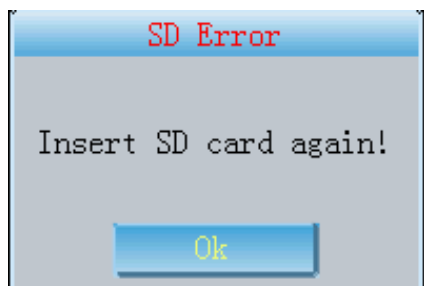


Fig. 13-11-3

4 If there is not enough memory in SD card to store this case, the prompt as Fig.13-11-4 will appear.

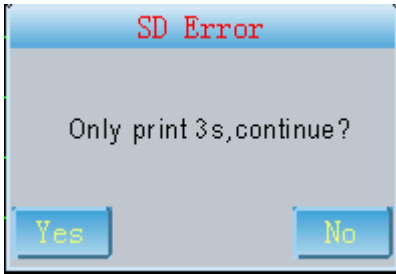


Fig. 13-11-4

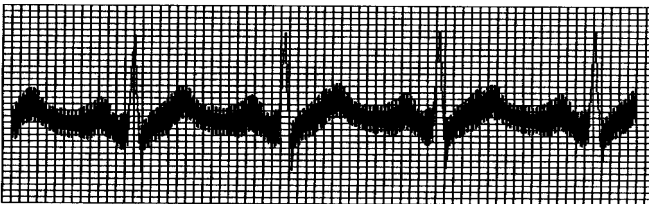
Click "Yes", and system will exit print, then clean up SD card and print again. If you need SD card, please show us before purchase.

Chapter14 TROUBLESHOOTING

14.1 Powering off Automatically

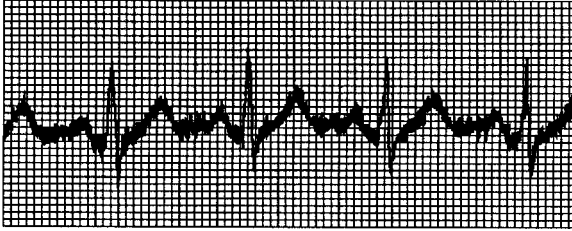
- 1 Whether or not the battery capacity is nearly exhausted?
Battery overdischarge protection circuit is activated.
- 2 Whether or not AC supply voltage is too high?
Overvoltage protection circuit is activated.
- 3 Whether or not AC interference is too large or fixed knob in lead cable socket is tightened?
Overload protection circuit is activated.

14.2 AC Interference



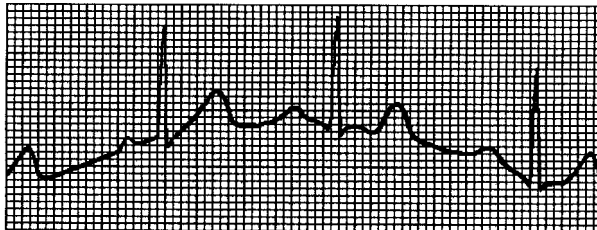
- 1 Whether or not the device is grounded reliably?
- 2 Whether or not the electrodes or lead cables are connected correctly?
- 3 Whether or not the electrodes and skin are smeared enough electric gel?
- 4 Whether or not the metal bed is grounded reliably?
- 5 Whether or not the patient has touched the wall or metal parts of the bed?
- 6 Whether or not the patient has touched other people?
- 7 Whether or not there is high-power electric equipment working nearby?
Such as X-ray machine or ultrasonic device, etc.

14.3 EMG Interference



- 1 Whether or not the room is comfortable?
- 2 Whether or not the patient is nervous?
- 3 Whether or not the bed space is narrow?

14.4 Baseline Drift



- 1 Whether or not the electrode placement is instable?
 - 2 Whether or not the electrodes or lead cables are connected reliably?
 - 3 Whether or not the electrodes and patient skin are cleaned and are smeared enough electric gel?
 - 4 Whether or not it is caused by patient's movement and breath?
 - 5 Whether or not the electrodes or leads are in bad connection?
- If you can not clear the interference after having taken all the measures above, use filter.

14.5 Troubleshooting List

Phenomenon	Cause of failure	Remedy
Too large interference, disorderly waveform.	<ol style="list-style-type: none"> 1. Grounding cable is not connected reliably. 2. Lead cables are not connected reliably. 3. There is AC interference. 4. Patient is nervous and can not keep quiet. 	<ol style="list-style-type: none"> 1. Check lead cables, grounding cable and power. 2. Do patient treatment well.
Baseline burr.	<ol style="list-style-type: none"> 1. AC interference is large. 2. Patient nervous, and EMG interference is large. 	<ol style="list-style-type: none"> 1. Amend the environment. 2. If the bed is made of steel, replace it. 3. The power cable and lead cables are not parallel or too close to each other.
Not regular waveform, large up-and-down, beeline figure.	<ol style="list-style-type: none"> 1. Bad electrode conductivity. 2. Battery capacity lack. 3. Bad connection between electrodes and patient skin. 4. Loose connection between lead cables. 5. Bad connection between lead cable and electrode. 	<ol style="list-style-type: none"> 1. Use alcohol of high quality. 2. Clean electrode slices and the skin below them with alcohol. 3. Charge the battery.
Baseline draft.	<ol style="list-style-type: none"> 1. Low power. 2. Patient movement. 	<ol style="list-style-type: none"> 1. Charge the battery. 2. Keep patient still.
Unclear waveform.	<ol style="list-style-type: none"> 1. The printer head surface is dirty. 2. The thermal paper problem. 	<ol style="list-style-type: none"> 1. In case of power cut, clean the printer head with alcohol, do not begin printing until the head is dry. 2. Replace the thermal print paper with specified one.

Chapter 15

MAINTENANCE

- 15.1** Do not open the enclosure of the device to avoid possible electric shock. Any maintenance and future upgrades to this device must be carried out by personnel trained and authorized by our company. The repair should be for our company's original components only.
- 15.2** Check the integrality of lead lines periodically. The damage of any lead line may cause no display of corresponding lead or all leads. Clean the lead lines with water and soap, and disinfect them with 75% alcohol.
- 15.3** Please store the electrodes properly. Disinfect them with 75% alcohol and replace them after long use.
- 15.4** Use the litmusless cleanser to clean the device. Don't immerge the device in the cleanser.
- 15.5** Please pull out the power plug when it is power cut. When not used for a long period, the device should be placed where it is shady, cool, and dry, powered on every 3 months.
- 15.6** Frequent maintenance is necessary for this device. Check it every 6 months and measure it once a year. If the device has stored/used for more than a year, please measure it before use again.
- 15.7** The schematic diagram and list of key parts of this device can be provided only to the service station or personnel authorized by our company.

Transportation and storage

- Transportation: Please carry out according to the regulation of contract.
- The device after packed should be stored indoor where temperature is $-40^{\circ}\text{C}\sim+55^{\circ}\text{C}$, and relative humidity is less than 95%, without corrosive gas and drafty.

Chapter 16

Packing List

The following is packing list.

Items	Qty	
Main unit	1 set	
Type A integrated 12-lead cable, European standard, TPU, DB15, 4.0, banana plug	1 pcs	Note 1
4.0 single pore ECG sucking ball, blue silica gel ball, nickel electrode	6 pcs	
4.0 single pore limb champ, nickel electrode	4 pcs	
Power adapter	1 pcs	
Power cord	1 pcs	
Grounding Cable(3m)	1 pcs	
User Manual	1 pcs	

If there is any lack or damage, please contact us.

Note 1: If you need proof defibrillation function, the option Type A integrated 12-lead cable, European standard, Defibrillator Proof, TPU, DB15, 4.0, banana plug. Model: BIT0059.

APPENDIX


Guidance and manufacturer's declaration – electromagnetic immunity

The device is intended for use in the electromagnetic environments listed below, and should only be used in such environments:

IMMUNITY TEST	IEC 60601 TEST LEVEL	COMPLIANCE LEVEL	ELECTROMAGNETIC ENVIRONMENT – GUIDANCE
Electrostatic discharge (ESD) IEC 61000-4-2	± 6 kV contact ± 8 kV air	± 6 kV contact ± 8 kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
Electrical fast transient/burst IEC 61000-4-4	± 2 kV for power supply lines	± 2 kV for power supply lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	± 1 kV line(s) to line(s) ± 2 kV line(s) to earth	± 1 kV line(s) to line(s) ± 2 kV line(s) to earth	Mains power quality should be that of a typical commercial or hospital environment.
Interruptions and voltage variations on power supply input lines IEC 61000-4-11	<5% U_T (>95% dip in U_T) for 0,5 cycle 40% U_T (60% dip in U_T) for 5 cycles 70% U_T (30% dip in U_T) for 25 cycles <5% U_T (>95% dip in U_T) for 5 sec	<5% U_T (>95% dip in U_T) for 0,5 cycle 40% U_T (60% dip in U_T) for 5 cycles 70% U_T (30% dip in U_T) for 25 cycles <5% U_T (>95% dip in U_T) for 5 sec	Mains power quality should be that of a typical commercial or hospital environment. If the user of the device requires continued operation during power mains interruptions, it is recommended that the device be powered from an uninterruptible power supply or a battery

Guidance and manufacturer's declaration – electromagnetic immunity

The device is intended for use in the electromagnetic environments listed below, and should only be used in such environments:

IMMUNITY TEST	IEC 60601 TEST LEVEL	COMPLIANCE LEVEL	ELECTROMAGNETIC ENVIRONMENT – GUIDANCE
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz	3 V	Portable and mobile RF communications equipment should be used no closer to any part of the device, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance $d = \left[\frac{3.5}{V_1} \right] \sqrt{P}$ $d = \left[\frac{3.5}{E_1} \right] \sqrt{P} \quad 80\text{MHz to } 800\text{MHz}$ $d = \left[\frac{7}{E_1} \right] \sqrt{P} \quad 800\text{MHz to } 2.5\text{GHz}$ Where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in metres (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey, ^a should be less than the compliance level in each frequency range. ^b Interference may occur in the vicinity of equipment marked with the following symbol: 
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2.5 GHz	3 V/m	






















NOTE 1 At 80 MHz and 800 MHz, the higher frequency range applies.

NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

a Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the device is used exceeds the applicable RF compliance level above, the device should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the device.

b Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.

Symbols

	Filter quick set		Fragile, handle with care
	SD card has been inserted		Keep in a cool, dry place
	No SD card inserted		Moisture limitation
	State of USB connection		Atmospheric pressure limitation
	Standby, charging		Temperature limitation
	12 V adapter port		Manufacturer
	Equipotential point		Date of manufacture
	Please read instructions carefully	IPX0	Impermeability index
	CF type with defibrillation protection		Keep away from sunlight
	Lead socket		Read instructions carefully
	WEEE	SN	Serial number
CE	Product complies with European Directive	EC REP	Authorized representative in the European community
	This side UP	REF	Product code



Disposal: *The product must not be disposed of along with other domestic waste. The users must dispose of this equipment by bringing it to a specific recycling point for electric and electronic equipment. For further information on recycling points contact the local authorities, the local recycling center or the shop where the product was purchased. If the equipment is not disposed of correctly, fines or penalties may be applied in accordance with the national legislation and regulations.*

GIMA WARRANTY CONDITIONS

Congratulations for purchasing a GIMA product. This product meets high qualitative standards both as regards the material and the production.

The warranty is valid for 12 months from the date of supply of GIMA.

During the period of validity of the warranty, GIMA will repair and/or replace free of charge all the defected parts due to production reasons.

Labor costs and personnel traveling expenses and packaging not included.

All components subject to wear are not included in the warranty.

The repair or replacement performed during the warranty period shall not extend the warranty. The warranty is void in the following cases: repairs performed by unauthorized personnel or with non-original spare parts, defects caused by negligence or incorrect use.

GIMA cannot be held responsible for malfunctioning on electronic devices or software due to outside agents such as: voltage changes, electro-magnetic fields, radio interferences, etc. The warranty is void if the above regulations are not observed and if the serial code (if available) has been removed, cancelled or changed. The defected products must be returned only to the dealer the product was purchased from. Products sent to GIMA will be rejected.

