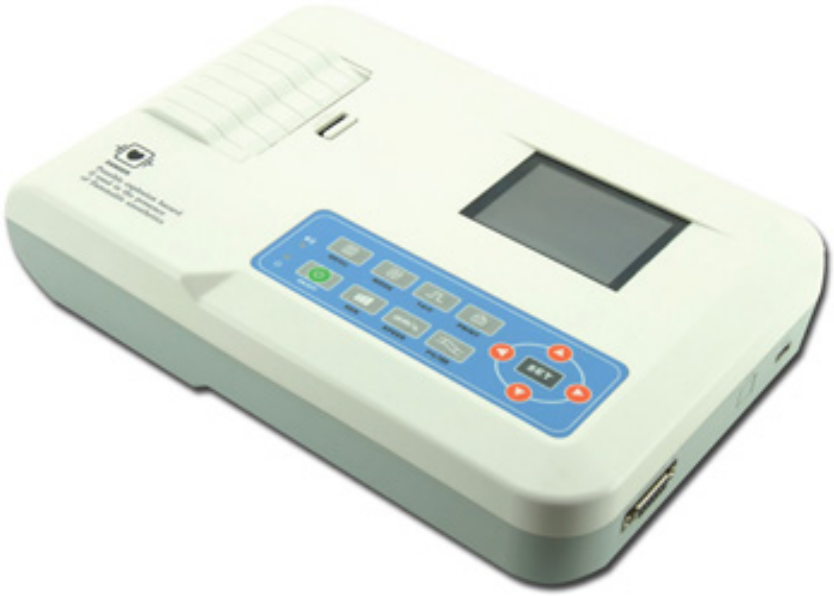
CONTEC™

300G CONTEC ECG - 3 channel with 12-leads monitor

USER MANUAL



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

REF **33221**

CE 0123

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Contents

Chapter 1 Main Technical Specification

1.1 Normal work environment

Operation

a) Environment temperature: +5℃ ~ +35℃

b) Relative humidity: ≤80%

c) Power supply: AC:100-240V, 50/60Hz

DC: 7.4V, 3700 mAh rechargeable lithium battery

d) Atmospheric pressure: 860hPa~1060hPa

Store and Transportation

a) Environment temperature: -40℃~55℃

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~dB)

1.7 Time constant: Time constant>3.2s

1.8 CMRR: >60dB, >100dB(With AC filter)

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

1.10 Recording way: Thermal printing system

1.11 Specification of recording paper: 80mm(W)*20m(L) High-speed thermal paper

1.12 Paper speed:

Auto-record:25mm/s,50mm/s,error: ±5%

Rhythm record:25mm/s,50mm/s,error: ±5%

Manual-record:5mm/s,6.25mm/s,10mm/s,12.5mm/s,25mm/s,50mm/s,error:±5%

1.13 Sensitivity choice: 2.5/5/10/20/40mm/mV, error:±5%.Standard sensitivity is10mm/mV±0.2mm/mV

1.14 Auto-record: record following the record format and auto-mode, auto leads-changing, auto measurement and analyse.

1.15 Rhythm record: record following the rhythm format and rhythm mode, auto measurement and analyse.

1.16 Manual record: record following the record format, manual leads-changing.

1.17 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)

1.18 Product safety type: Class I, Type CF, there is defibrillation and pacing protection circuit.

1.19 Enduring polarization voltage:±300mV

1.20 Noise level: ≤15μVp-p

1.21 Fuse Specification: 2 pcs φ5*20mm AC time lag: T1.6AL250V

1.22 Size: 315mm(L)*215mm(W)*77mm(H)

1.23 Net Weight: 1.6Kg

Chapter 2 Security Notice

2.1 The power supply should be grounded properly before operation.

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

2.3 Please pull out power supply plug before changing the fuse.

2.4 This device must be operated and preserved by professional personnel.

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

2.6 The design of this device has mature consideration of security, but operator should never neglect attention to device state and patient's situation.

2.7 Please turn off the instrument and pull out power supply plug before clean and disinfection.

2.8 Please don't operate this device in environment which contains flammable anaesthesia gas.

2.9 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.

2.10 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.

2.11 Following descriptions concern special attentions in ECG measurement and interpretation.

(1) P wave and Q wave are not always reliable in the archive of intensive muscle artifact or AC interference. So are the ST segment and T wave.

(2) Winding and unclear ends of S wave and T wave may lead to tolerance in measurement.

(3) In archive R wave is left out due to the low voltage of QRS wave or any leads falling off, the measured heart rate may deviate greatly from the correct one.

(4) Axis calculation and identify the QRS borderline are not always reliable in the archive of the low voltage of QRS wave.

(5) Occasionally, frequent ventricular premature complexes may be identified as dominant beat.

(6) Merging of versatile arrhythmia may result in untrustworthy measurement because of the difficulty in distinguishing P wave in such situation.

(7) ECG300G 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 ECG300G ’s interpretation and other examination.

Chapter 3 Maintenance Regulation

3.1 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. To supply all-around and fast maintenance service to our customers, please mail the maintenance card to us in time.

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

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

1) Faults or damnification caused by misuse because not operate according to user manual and operation notice.
2) Faults or damnification caused by dropping accidently when users move after purchasing.
3) Faults or damnification caused by preparation, reconstruction, decomposition, etc. outside of our company.
4) Faults or damnification caused by natural disasters such as fire, flood, earthquake, etc.
5) Faults or damnification caused by unapt thermal recording paper.

3.4 The free maintenance period for spare parts 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 connecting instruments cause by the faults of this device directly or indirectly.

3.6 The maintenance service is only efficient in Chinese Mainland.

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

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

Chapter 4 Instrument Characteristics

4.1 Recording system: Thermal-array (8 dots/mm),you should not adjust anything Frequency Response is up to 150Hz.

4.2 The device can record real time clear and exact three channel ECG waveform and remark continually. The remark includes: lead sign, sensitivity, paper speed, filter state, etc.

4.3 Under automatic mode, just press the button once, it starts record procedure, which can enhance your
work efficiency.

4.4 Soft keyboard control, more convenient for operation. TFT screen shows the working status, more clear for observation.

4.5 Safety Class: Class I, Type CF.

4.6 The power supply includes both AC/DC. This device includes built-in lithium rechargeable battery,

4.7 This instrument can record 150 pieces of ECG waveform and print 90 minutes continually under the best DC state.

4.8 This instrument can store more than 1000 pieces patient's data, more convenient for data review and statistic.

4.9 The figure of whole device is elegant and gliding.

4.10 According to defense degree of deleterious fluid, this device belongs to common device.

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

4.12 Digital signal processor for effective inhibition of baseline drift, interference, and the like.

4.13 The instrument has function with regular auto-measurement of ECG waveform parameter, auto-analyze and auto-diagnostic, it will help to reduce doctor's burden and improve working efficiency.

4.14 According to the working mode class, this device belongs to non-continuous working device.

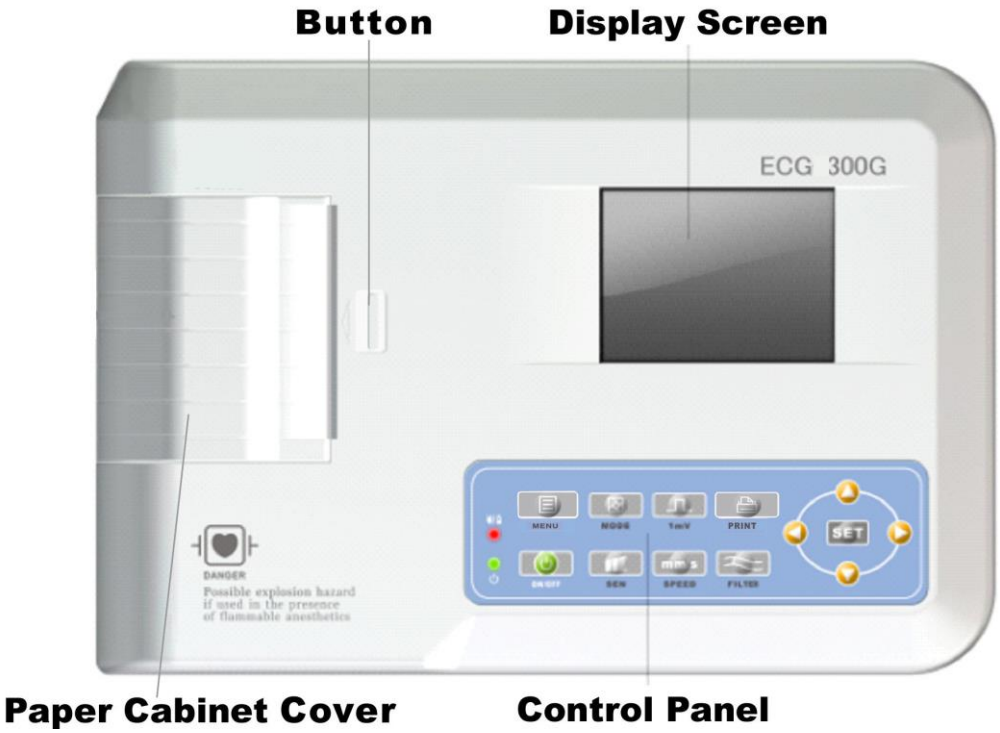
4.15 Explanation of some symbols in this device:

～**AC**	AC work mode
OFF	Power supply is disconnected
ON	Power supply is connected
⏚	Equipotential point
⚠	Places need to be noticed, please refer to user manual

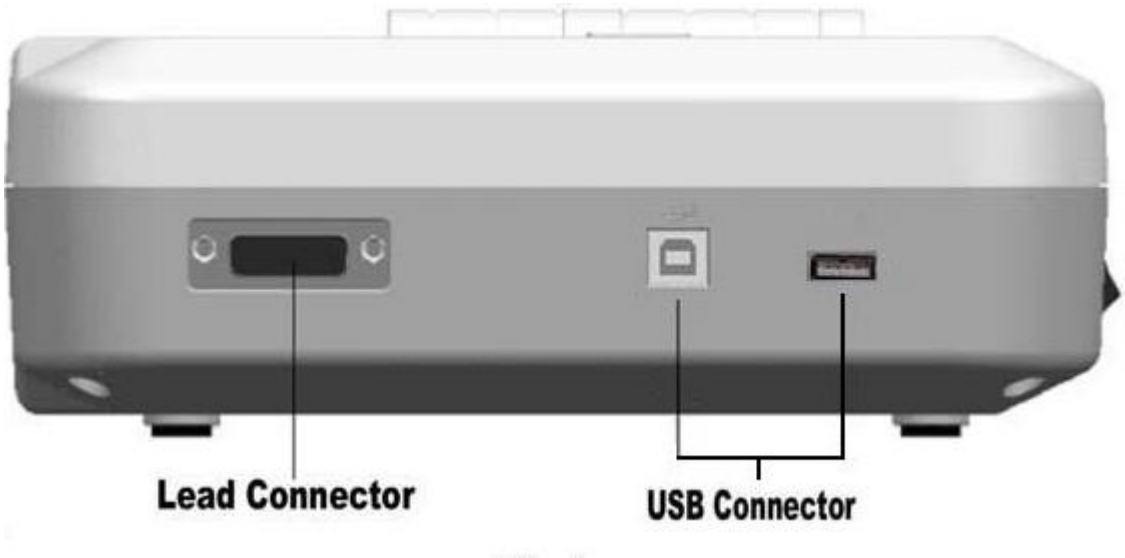
	Device type is CF, which has defibrillation protection function
	USB connector
◀ PATIENT	Lead connector

Chapter 5 ECG300G Panel Sketch Map

5.1 The Sketch Map and Components Name



Front view



Side view

Rear view

Bottom view

5.2 Key Definition


Function key: on/off


Function key: plus adjust

Function key: paper speed adjust


Function key: filter function select


Function key: menu


Function key: switch printing mode


Function key:1mV marker


Function key: print

Function key: enter


Function key: upwards


Function key: downwards


Function key: leftwards


Function key: rightwards

5.3 Indicator Definition


The indicator turns green when there is AC power supply, and when the indicator turns green and red same time it is being recharged.


Indicator for instrument when power on.

Chapter 6 Attention before Operating

6.1 You are required to read this operation manual carefully before operating so as to ensure taking safe and effective operation of the instrument.

6.2 Installation and maintenance of the instrument should be carried out as the following

1) There should be no high voltage cable, X radial instrument, ultrasound instrument and electrotherapeutics instrument, etc. around the ECG instrument.
2) Do not use or reserve the instrument in the place where the air pressure is too high, temperature and humidity are over the common standard, the ventilation is not good, dust is too much, there is gas containing salt and alkali and chemical medicine.

6.3 The instrument should be put on flat place. Take and put it lightly when move it. Avoid too strong vibration and shock.

6.4 AC frequency and voltage value should accord with requirement ,and has enough current capacity.

6.5 Please put the device at the place where is easy to be grounded. Do not connect the patients and the

patients connecting cables with other conductors including ground or beds which can be conducted well

with ground.

6.6 Please ensure the device operated in the range of environment temperature: 5℃~35℃. If the device is reserved in higher temperature or lower temperature environments, please wait for about 10 minutes before using it, to ensure normal operation of the device.

Chapter 7 Preparation Work before Instrumentation

7.1 Check that the instrument properly grounded and that cable connections safe or not.

7.2 Make sure all electrodes directly connected with patient are properly and firm.

7.3 Check the output voltage when choose the DC UPS.

7.4 Smear the gel separately, avoiding the short circuit caused by the chest electrode touch one another.

7.5 AC power cable can not be enlaced with ECG cable.

Chapter 8 Precaution during Operation

8.1 Pay attention to the patient and instrument condition constantly.

8.2 Patient and instrument can only be connected ECG cables.

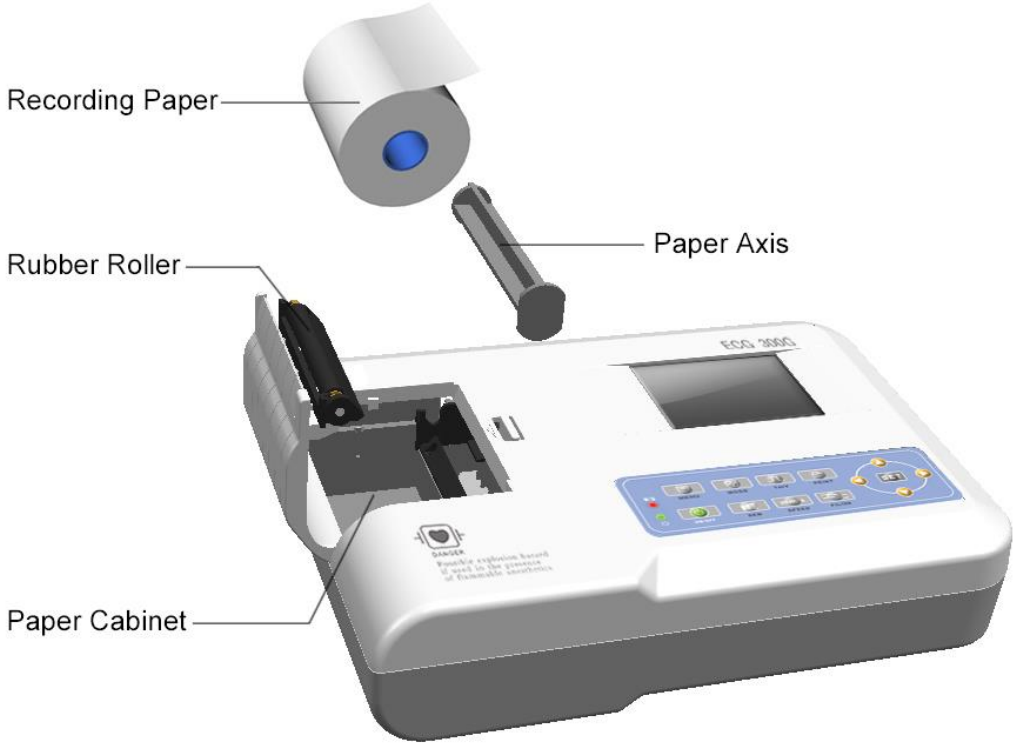
8.3 Keep close observation of the patient and instrument, to make sure they are not moved during operation.

8.4 Turn off the instrument after using.

8.5 Turn off the power, and remove the ECG cables slightly without force.

8.6 Properly keep the instrument and spare parts for operation next time.

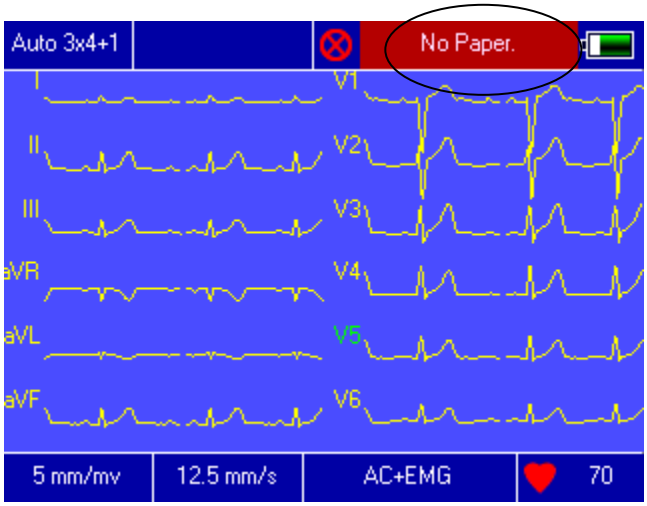
8.7 Paper Loading



1) Dimension of the high-speed thermal Recording paper used in this instrument is: 80mm(W)*20m(L)
2) Open the cover of paper cabinet, take out the paper axis and install recording paper according to the figure into the proper position inside.
3) Close the cover of paper cabinet. It's recommended to leave 2 cm of recording paper outside.

Chapter 9 Instruction of Recording Paper

9.1 Message "No Paper." will be displayed on the LCD whenever recording paper is run out.



9.2 Specified paper of high sensitivity is recommended for high-quality prints. Other kind of paper may not render a clear permanent trace and may damage the printing mechanism. Please consult distributor or manufacture for detail of how to purchase the paper.

9.3 Failure of the recording paper might be affected by high temperature, bad humidity or direct sunlight. For long storage, the recording paper should be placed in dry, dark and cool area.

9.4 Substance may caused stain of the recording paper:

Gel, glue, and wet diazo compound paper including their organic solvent.

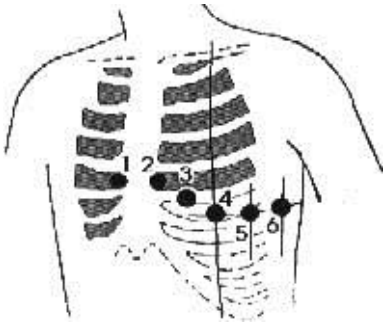
9.5 Substance may caused the waves fade away:

File folders made of soft PVC material, plastic etc.; eraser and magnetic tape contains plasticizer; fluorescence, and stamp-pad ink.

Chapter 10 Electrode Placement

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

10.1 Chest Electrode



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.

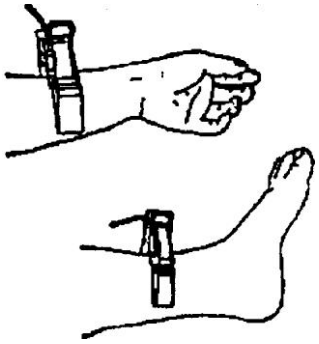
V6: Left mid-axillary line at the horizontal lever of V4.

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, and 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.

10.2 Limb Electrode

Electrodes should be placed on the soft skin of hands and feet. Clean all the limb electrodes and the positions around to which limb electrodes are to be attached with alcohol before applying ECG cream to them, then firmly attach the electrodes to the positions.



Caution: Screw tightly the knob of ECG cable's plug after it inserted to the instrument.

10.3 Check-List for Electrode Connection and ECG cable

Electrode Location	Electrode Code	Socket Number
Right Alarm	RA/R	9
Left Alarm	LA/L	l0
Left Leg	LL/F	11
Right Leg	RL/N	14
Chest 1	Vl/Cl	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

Note:

1. **Please apply leads in the close state.**
2. **Please check the electrode contact the skin well or not, if the ECG didn't appeare for a long time, then press the start key which will close in several milliseconds several times.**
3. **please apply conductive jelly when place electrode.**

Chapter 11 Grounding and Power Connection of Instrument

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.

Chapter 12 Precaution for Battery Operation

12.1 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 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 90 minutes and work 4 hours without printing after the battery fully charged. When it 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 Seven status of the battery power displayed on LCD as following:

No.	Mark	Description
a		Unknown status, normally displayed while the instrument being turned on within 1 minute
b		Using AC power
c		Using battery, and full power
d		Using battery, volume : 3/4
e		Using battery, volume: 1/2
f		Using battery, volume : 1/4
g		Using battery, but lower power, suggest to recharge the battery or use AC power supply

Note: When charging the battery icon shift from f to c.

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

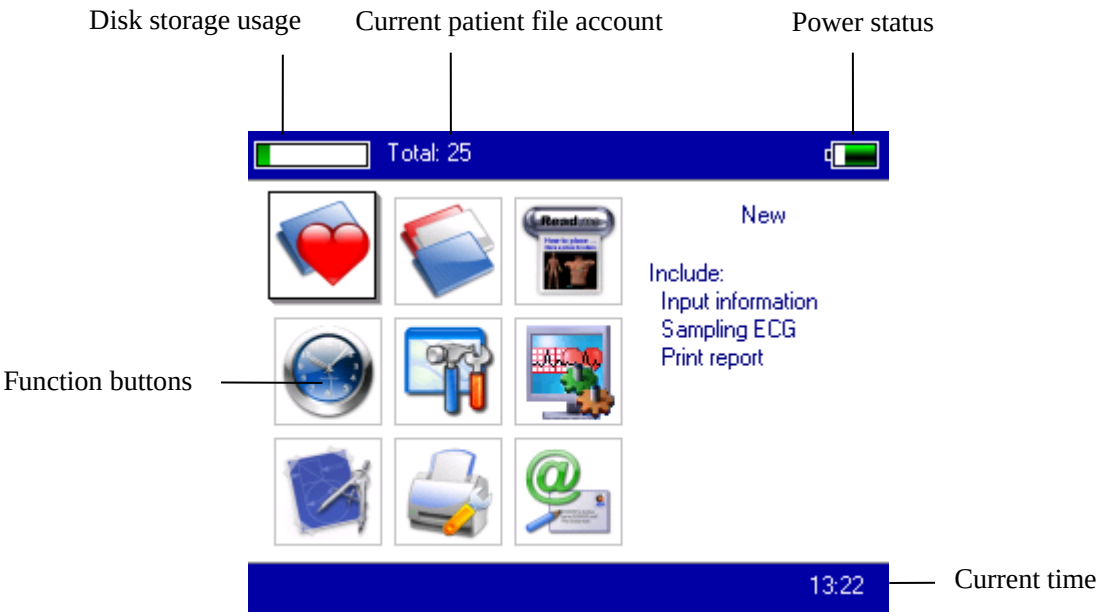
Attention!!!

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

Chapter 13 Control Panel and Key Instruction

13.1 Main Interface

Show as following:



Power status:Please refer to 12.4

Keypad:

Enter sampling interface. when the instrument is powered on, it will automatically start this operation.

Enter Archive management interface, query , modify or delete archive information

See sketch map for electrodes placement

Date and time settings

System settings

Sampling settings

Analysis parameters settings. settings for each parameter using for automatic analysis

Printing settings, set printing mode, style and content.

About us, display information about our company and software version

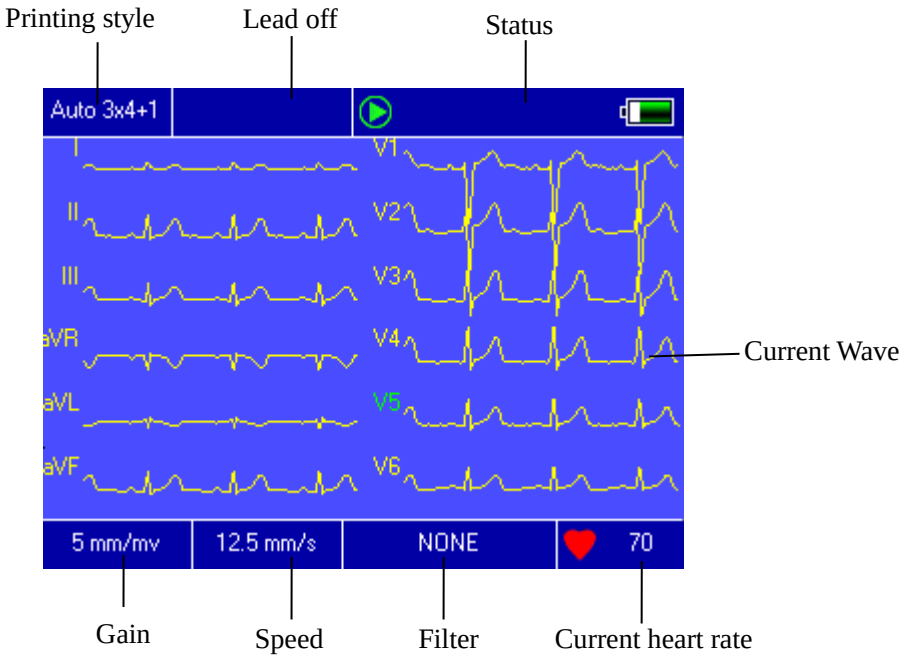
13.2 Sampling Interface

Select  on the main menu or choose shortcut key  to enter sampling interface.

Attention: Because of the "setting", Patient information may be input before sampling signal, rest with the option : inputting archive information.

It displays multiform lead waves, including 3 Leads per screen, 6 Leads per screen, 12 Leads per screen.

Sampling interface of 12 leads style can be displayed as following:



Stop Sampling: Press key  on the keypad to stop sampling and return to main interface.

Lead Change: You can press key  /  to show the other leads. The leads use by manual print.

Switch Lead Style: Press key  /  to switch the lead style among 3 leads per screen, 6 leads per screen and 12 leads per screen.

Lead Off: Under Demo mode, it displays "DEMO ECG". Under sampling mode, it displays information of lead off.

Change Recording Style: Press this key  to change recording mode among auto 4*3, auto 3*4 +1, auto 3*4, auto 2*6 +1, auto 2*6, auto3-2+1, auto3-2,rhythm 4, rhythm 3, rhythm 2 and manual mode.

Adjust Gain (Sensitivity Selection): Sensitivity is to be selected by pressing key  . User can choose 2.5mm/mV, 5mm/mV, 10mm/mV, 20mm/mV or 40mm/mV.

Adjust the speed: Use the key of speed adjusting 

to change the speed :5mm/s, 6.25mm/s, 10mm/s, 12.5mm/s, 25mm/s, 50mm/s. Auto-record and Rhythm record can not support 5mm/s, 6.25mm/s, 10mm/s, 12.5mm/s when printing.

Shift the filter: Use the key of filter selection  to shift between non-filter,AC,EMG,DFT,AC+EMG,AC+DFT,EMG+DFT,AC+EMG+DFT.

Display the calibration: Use the key of "1 mV"  to display the marker of 1 mV on the screen.

Print/ finish the print: Use the key of "print"  on the keyboard, then can start or stop a printing operation.

Automatic mode: After starting printing, the system will print and store synchronic twelve leads waveform automatically. The length decided by the setting item in the printing option. And also according to the setting item, print out the data and result which analysed automatically and the system can finish the printing automatically.

Manual mode: After starting printing, the user should print out the real waveform by shifting the group of leads. That means the ECG waveform printing under the manual mode is non-synchronic, and cannot be saved. And the user should end the printing by press the key again.

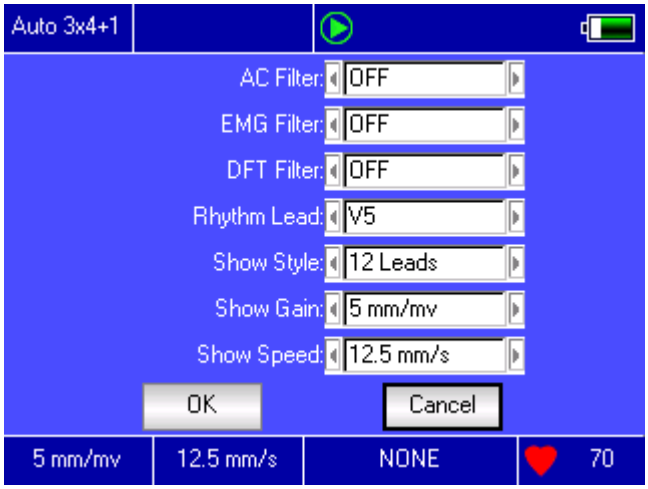
During printing, the printing state includes:

Display content	Remark
Process…	In the process of printing
Waiting…	In the process of ending printing
No Paper.	Lack of paper, the user should restart the operation after filling papers.
Print Timeout.	The connection between system and printing sub-system broke.
ECG Timeout	The connection between system and sampling sub-system broke.
Low Power	Low power, the system can not start the print work.

Note:Please print after the ECG was displayed in the screen .

On this interface, press the button 

on key board, the system will enter the shortcut setting interface:



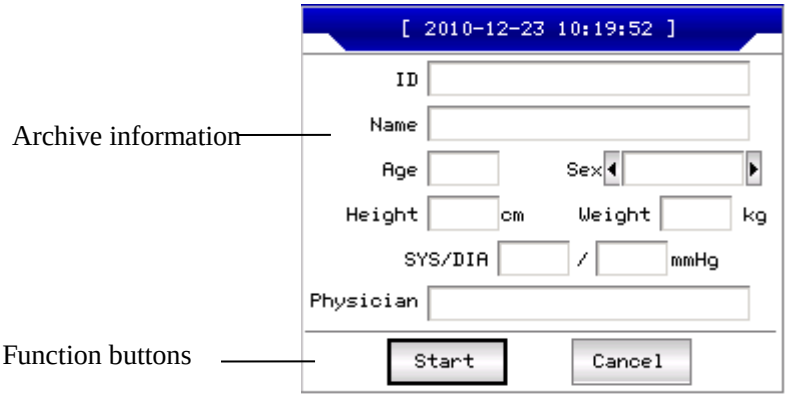
Select【OK】button,the system will apply new settings and return to sampling interface. Select【Cancel】, the system will return to sampling interface without apply the new settings.

The each function of option is shown in the following table.

Item	Optional content	Remark
AC Filter	[ON]/[OFF]	Setting of using AC Filter or not
EMG Filter	[ON]/[OFF]	Setting of using EMG Filter or not
DFT Filter	[ON]/[OFF]	Setting of using DFT Filter or not
Rhythm Lead	Any one of 12 leads	Setting the rhythm lead to print ECG in rhythm print mode.
Show Style	[3 Leads]/[6Leads]/[12Leads]	Setting of wave show style.
Show Gain	[2.5mm/mV]/[[5mm/mV]/[10mm/mV]/[20mm/mV]/[40mm/mV]	Setting of wave show gain.
Show Speed	[5mm/s]/[6.25mm/s]/[10mm/s]/[12.5 mm/s]/[25mm/s]/[50mm/s]	Setting of wave show speed. Auto-record and Rhythm record cannot support 5mm/s,6.25mm/s,10mm/s,12.5mm/s when printing.

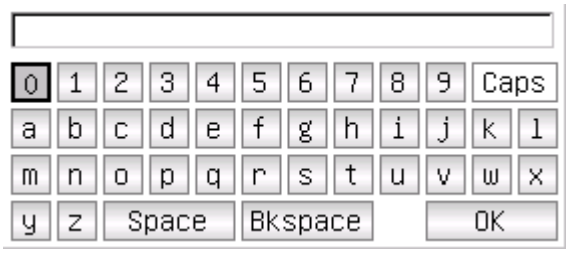
13.3 Inputing Archive Information

According to the different setting items(refer to 13.8), user can input the patient archive before or after sampling, and also can input blank archive. The input box as following:

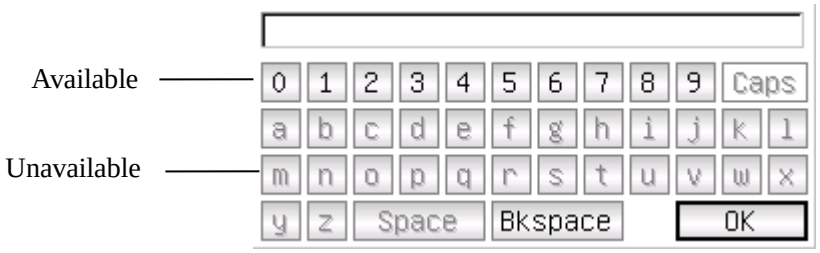


Choose any input-box, as pressing SET key, the "soft keyboard" will pop out as following.

The function of 【Caps】button on "soft keyboard" is to change the number key and lower archive to punctuation and upper archive. Press【OK】will confirm input and exit this interface.

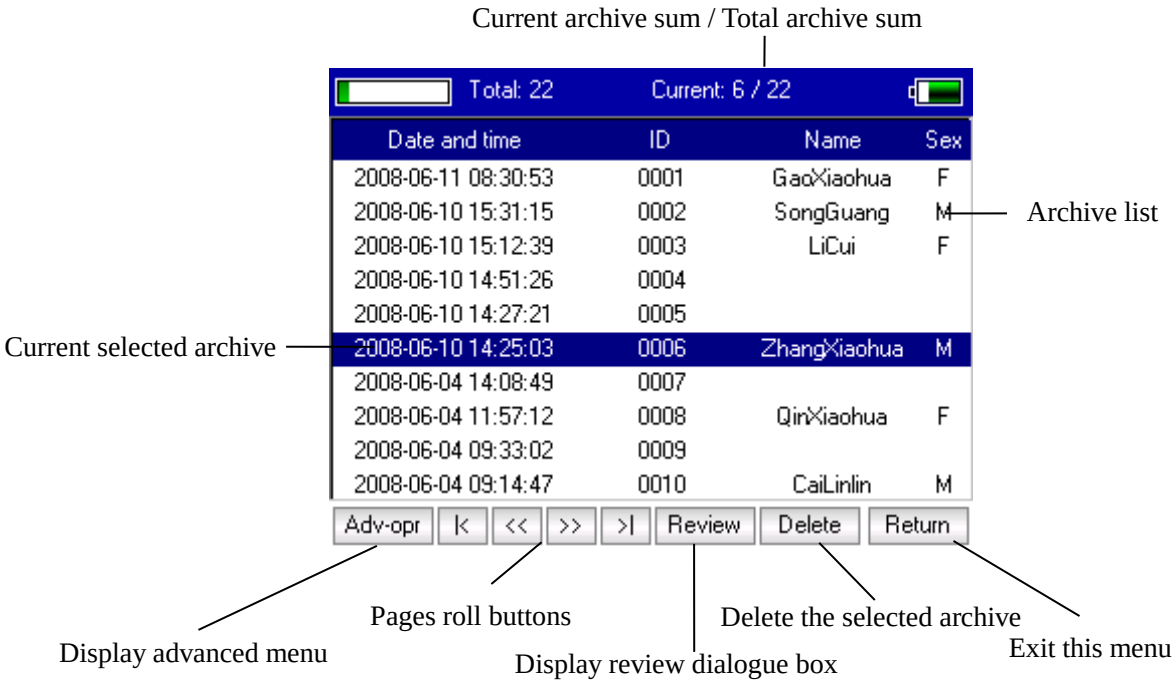


There maybe a limit of character according to the content input. And then the limited character will be gray and unavailable, as following:



13.4 History Archive Management

In the main interface, select the button of  , then you can enter the archive management interface, as following.



This interface shows all the storage archive. The users can use the searching function (refer to 13.5 archive querying) to select the required archive; and edit any archive by modifying or deleting operation; besides the user can review the saved archive information. (refer to 13.6 archive review).

: Go to the first page of archive list.

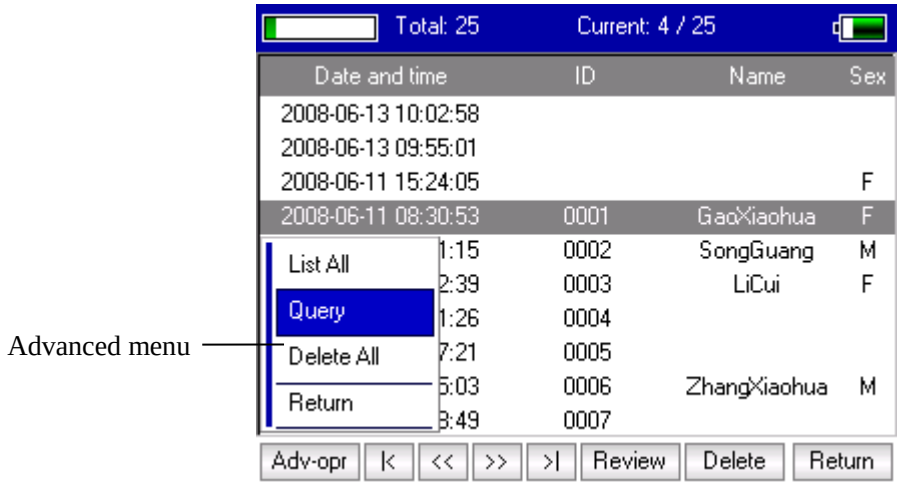
: Go to the last page of archive list.

: Go to the previous page of archive list.

: Go to the next page of archive list.

13.5 Archive Querying.

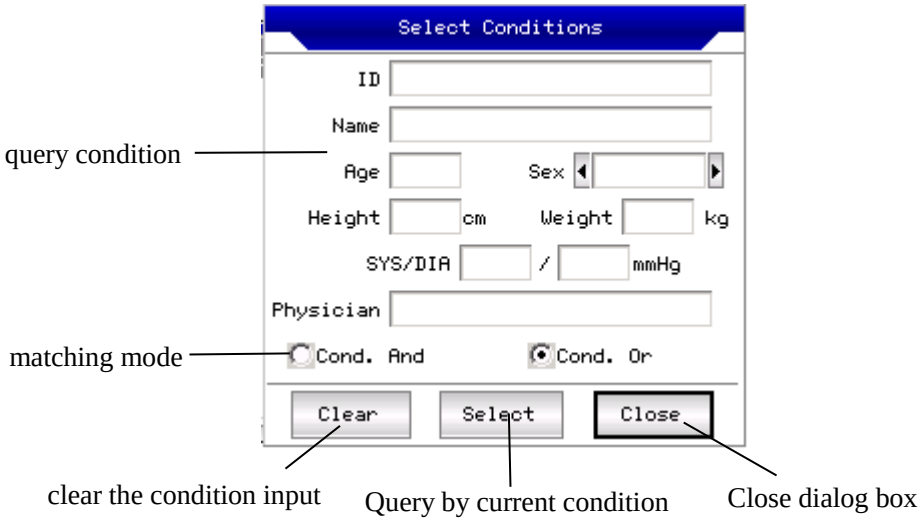
Choose 【Adv-Opr】 in the archive management ,then it shows as following:



Select 【Query】 can start a archive Query dialogue box as following.

Input searching condition, and select 【Select】 button, and the user can get expected result.

The function of 【Clear】 is to clear the query condition input.

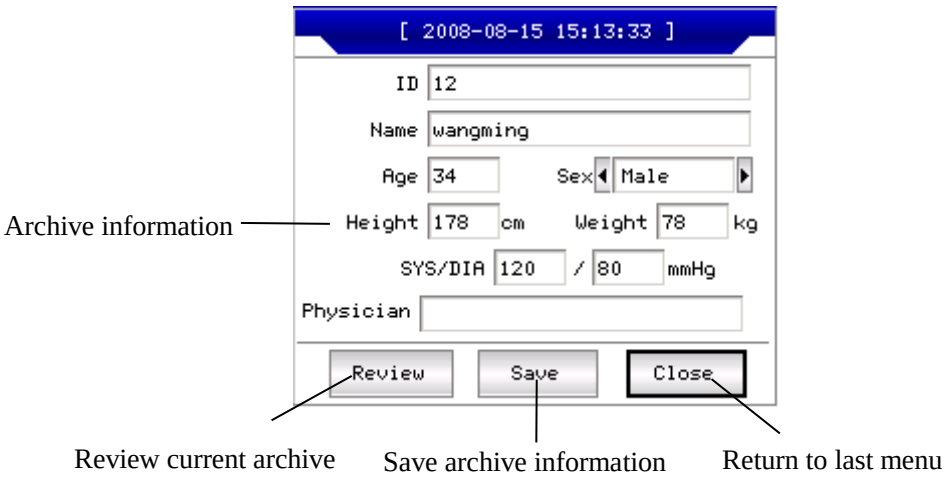


【Cond. and】and【Cond. or】indicate the matching mode of searching condition, the user can select either. If select 【Cond. and】, the searching result will fit all the conditions input simultaneity; if select 【Cond. or】, the searching result will display the ones which fit any of the conditions.

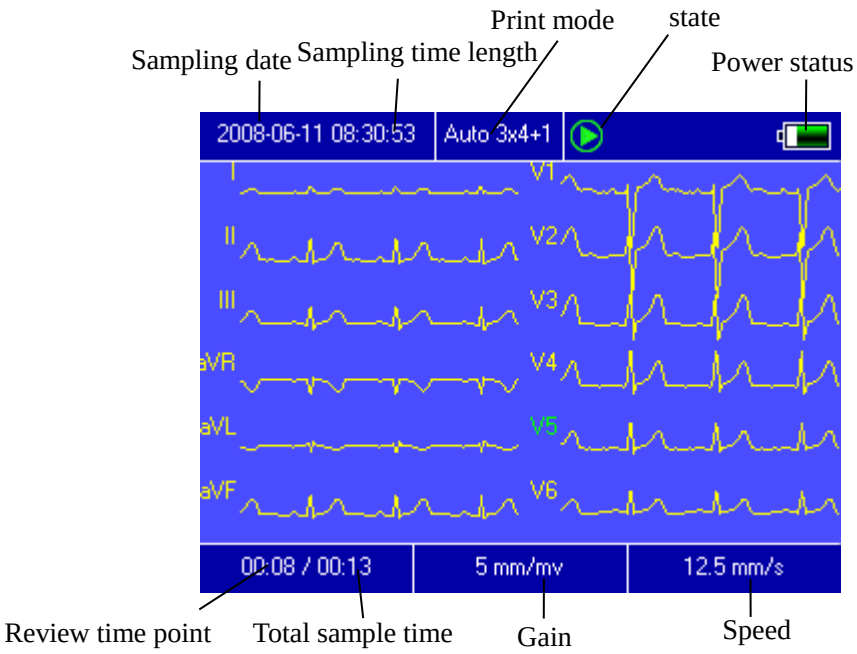
Suggestion: On the conditions of large number of patients archive, should input the confirmed searching conditions, select 【Cond. and】, can find out the certain patient archive immediately.

13.6 Archive Review

On Archive management interface, after moving focus on the right patient archive being reviewed, select 【Review】can start the following dialogue box which shows the patients archive information, users can modify here, select 【Save】, the change, which is not reversible ,will be saved.



Make sure the correct selection, select 【Review】 button, and can go into the following review interface which is similar to sampling interface.



In this interface, the user can adjust the time segment of the display waveform by  and  , and also the speed and gain.(refer to 13.2 sampling interface). In this state , the user can print by pressing  . Pressing  , system will enter the shortcut settings interfaces following:

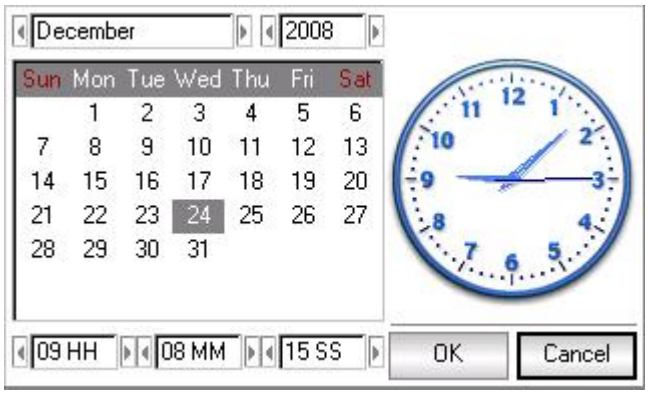
Select【OK】button, the system will apply the new settings and return to review interface.Select【Cancel】 button, the system will return to review interface without applying the new settings.

Each function of the option is as following:

Item	Optional content	Remark
Print Mode	[Auto 3*4]/[Auto 2*6]/[Auto 4*3] and any mode suit current archive	Setting of printing mode.
Rhythm Lead	Anyone of 12 leads	Setting the rhythm lead to print ECG in rhythm print mode.
Show Style	[3 Leads]/[6 Leads]/[12 Leads]	Setting of wave show style.
Show Gain	[2.5mm/mV]/[5mm/mV]/[10mm/mV]/ [20mm/mV]/[40mm/mV]	Setting of wave show gain.
Show Speed	[5mm/s]/[6.25mm/s]/[10mm/s]/ [12.5mm/s]/[25mm/s]/[50mm/s]	Setting of wave show speed.Auto-record and Rhythm record can not support 5mm/s , 6.25mm/s, 10mm/s, 12.5mm/s when printing.

13.7 Date and Time Settings

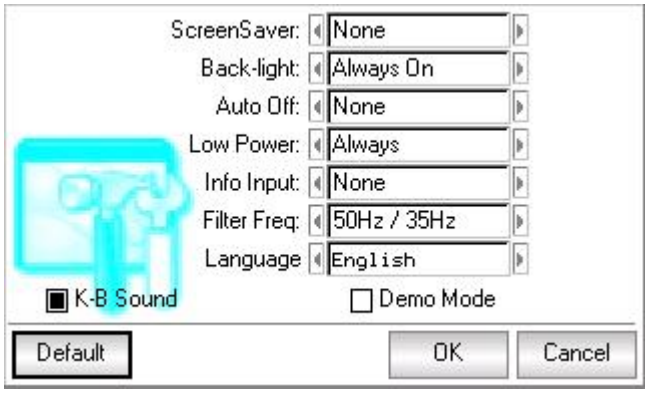
In the main interface, select  button, can start the following dialogue box showing the date and time settings.



In this interface, the users can select  and  key to shift all the items, using  and  to adjust the options content.

13.8 System Settings

In the main interface, select  button, can start the following system settings dialogue box.



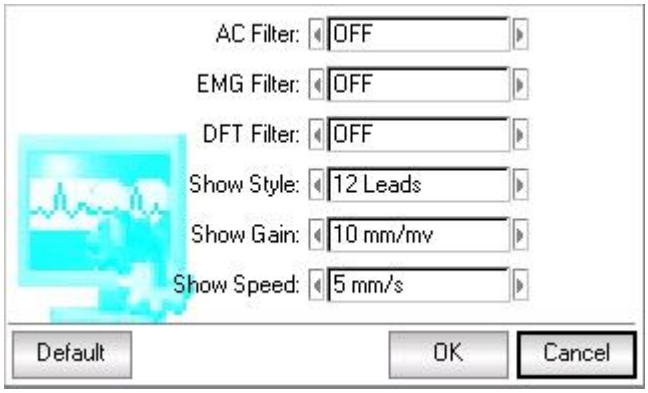
In this, select the button【Default】, the system settings will back to the default.

The each function of option is as following:

Item	Optional content	Remark
Screen saver	None/30Seconds/1Minute/ 2Minutes/5Minutes/10Minutes	The screen saver will be active after the selected time without any operation. "None" means that this function will not be used.
Back-Light	30Seconds/1Minute/2Minutes/5Minutes/10Minutes/ Always On	The back-light will be turned off after the selected time."Always On" means that the back-light will be turned off never.
Auto off	1Minute/3Minutes/5Minutes / 10Minutes/15Minutes/ 30Minutes/60Minutes/None	The system will be shut down if no operation after the selected time. None means the fuction is not effective.
Low Power	None/Only Once /Always	The system will take which alarm scheme when the power of battery is going to be used up.
Info Input	Before/After/None	Set up the time when inputting archive information.
Filter Freq	[50Hz/35Hz]/[50Hz/25Hz]/ [60Hz/25Hz]/[60Hz/35Hz]	Set up the parameter of AC Filter and EMG Filter.
Language	[English]/[Chinese], etc.	Set up the default system language.
K-B Sound	On/Off	When pressing the key on keyboard, the instrument will make a sound if "On" is selected.otherwise it will no sound.
Demo Mode	On/Off	The system will run under demo version, if "On" is selected. otherwise it will run under normal version.

13.9 Sampling Settings

Select  in the main interface, can start the following sampling setting dialogue box.



Select the button【Default】, the sampling settings will back to the default.

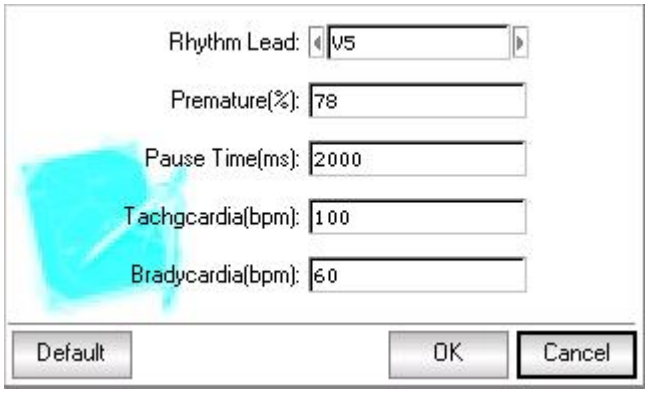
The each function of option is as following:

Item	Optional content	Remark
AC Filter	[ON]/[OFF]	Setting of default using AC Filter or not.
EMG Filter	[ON]/[OFF]	Setting of default using EMG Filter or not.
DFT Filter	[ON]/[OFF]	Setting of default using DFT Filter or not.
Show Style	[3 Leads]/[6 Leads]/[12 Leads]	Setting of default show style.
Show Gain	[2.5mm/mV]/[5mm/mV]/[10mm/mV]/[20mm/mV]/[40mm/mV]	Setting of default show gain.
Show Speed	[5mm/s]/[6.25mm/s]/[10mm/s]/[12.5mm/s]/[25mm/s]/[50mm/s]	Setting of default show speed.Auto-record and Rhythm record can not support 5mm/s,10mm/s,12.5mm/s when printing.

13.10 Analysing Parameter Settings.

Select the  button in the main interface can start the following analyzing parameter setting dialogue box:

The settings here will affect the diagnose hint of the real-time analysis, archive review and print report during sampling.



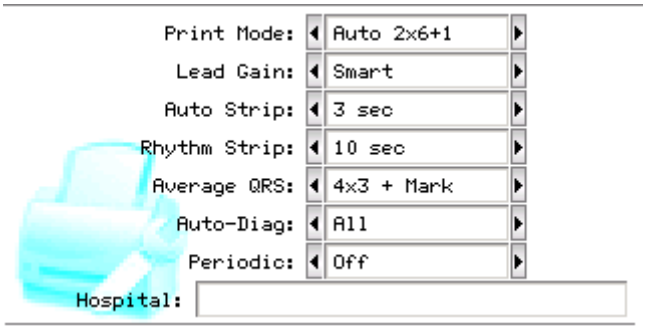
Select the button【Default】, the system settings will back to the default.

Refer to follow:

Item	Remark
Rhythm Lead	Setting the rhythm lead to analyze heart rate and print ECG in rhythm print mode.
Premature	The system will use the inputted value as a standard of judging premature beat .
Pause Time	The system will use the inputted value as a standard of judging pause beat.
Tachycardia	The system will use the inputted value as a standard of judging tachycardia.
Bradycardia	The system will use the inputted value as a standard of judging bradycardia.

13.11 Print Settings

Select the  button in the main interface, can start the print setting dialogue box like illustration:



Select the button【Default】, the print settings will back to the default.

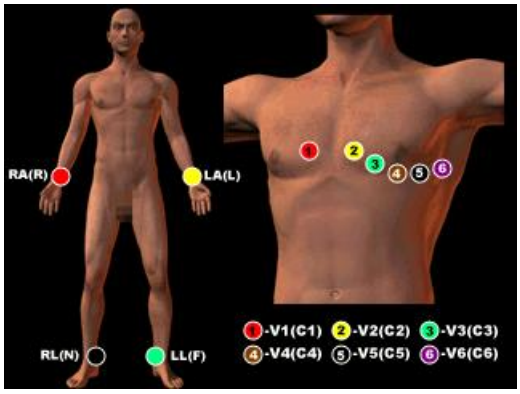
In this interface, the automatic mode option can only be effective when select "auto" in 【Print Mode】.

Item	Optional content	Remark
Print Mode	[Auto 3*4+1] /[Auto3*4] /[Auto2*6+1] /[Auto2*6]/ [[Auto 4*3] /[Rhythm2]/ [Rhythm 3]/[Rhythm4]/ [Manual]	The selection will be used as the default print mode.
Lead Gain	Smart/Current	The selection will be used as the default Lead Gain. "Smart" means that the system will adjust the lead gain automatic to fit the height of paper while printing. "Current" means that the system will use the screen lead gain while printing.
Auto strip	3Sec/4Sec/5Sec/6Sec/8Sec/ 10Sec/15Sec/20Sec/25Sec	The selection will be used as the default print time length of step.
Rhythm strip	10Sec/15Sec/20Sec/25Sec/ 30Sec	Under the print mode is "Rhythm 2", "Rhythm 3" Or "Rhythm 4", the system will use the select option as the print time length of rhythm strip.
Average QRS	[2*6]/[2*6+Mark]/[3*4]/ [3*4+Mark]/[4*3]/ [4*3+Mark]/[None]	Under the print mode is "Rhythm" Or "Auto",the system will use the select option as the default print style of average QRS.
Auto-Diag	All/Data/Conclusion/None	The auto-diagnose contains 2 parts of data and conclusion, user can print one of them only as his wish.
Periodic	[per1Min]/[per2Min]/ [per3Min]/[per5Min]/ [per10Min]/[per20Min]/ [per30Min]/[per60Min]/[off]	The system will print ECG periodically in the select time interval, If the option of print mode is selected as "Manual", the system will print in "Auto3 * 4 + 1". Otherwise, the system will print in selected mode.
Hospital	Fill in it yourself.	Fill the hospital name in it.

Note: Auto strip, Rhythm strip, Average QRS, Auto-Diag, Periodic are available when "Auto" or "Rhythm" print mode is selected.

13.12 Checking Electrodes Placement

Select  button on the main interface can start the following lead emplace illustration interface:



Select any key can exit this interface.

13.13 About Us

Select  button in the main interface can start the information interface related to this instrument.

This interface shows the instrument name, version, company name, copyright and company contact detail.

Chapter 14 Troubleshooting

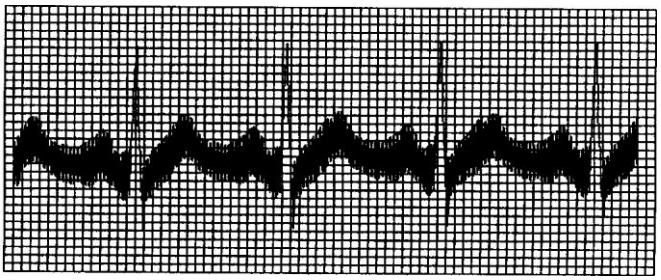
14.1 Turn off Automatically

① Please check whether the power of battery is used up. Over discharge control circuit of the battery acts.

② Please check whether the alternating current voltage is too high. Overvoltage control circuit acts.

③ Please check whether the alternating current disturb is too high, whether the fix knob of lead plug is too tight. Shut automatically is for protecting circuit when overload.

14.2 AC Interference



① Is the ECG device ground cable proper?

② Are the electrodes and leads connected properly?

③ Is the electrode and skin covered with enough Gel?

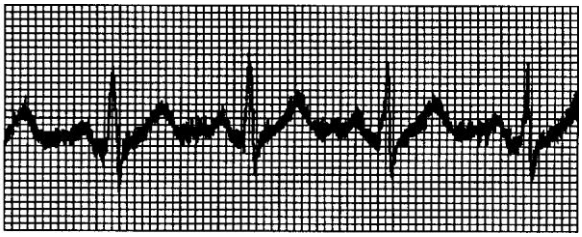
④ Is the metal bed grounding proper?

⑤ Does the patient touch the wall or metal sickbed?

⑥ Does other people touch the patient?

⑦ Whether there is powerful electric device working beside ECG device? For example: X radial device or B-Ultrasound devices.

14.3 EMG Interference

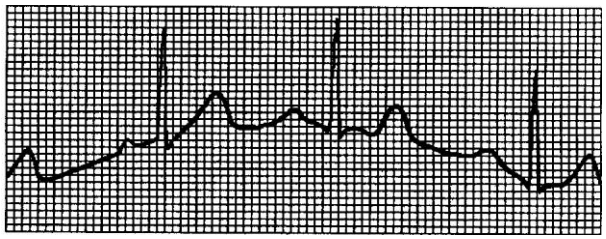


① Whether the patient room is comfortable.

② Is the patient nervous?

③ Is the sickbed too narrow?

14.4 Baseline Drift



① Verify the electrode attachment and lead wire performance.

② Check the connection between patient cable and electrodes.

③ Check the cleaning of electrode and patient skin. Is the electrode and skin covered with enough Gel?

④ Keep the patient from motion or hyperventilation.

⑤ Is the connection between lead and electrode proper?

Please use filter if still having above-mentioned interference.

14.5 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. 4.Patient is nervous	1.Please check the lead, ground cable and power supply. 2.Please dispose the patient in proper state.
Baseline is rough	1.Disturbance from alternating current is too fierce. 2.Patient is nervous and the disturbance of EMG too strong	1.Change a comfortable environment for patient 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. 2.Power of battery is used up 3.Contact between electrode and skin is not proper. 4.The plug between lead and main unit is not tight. 5.The contact between lead and electrode is not proper.	1.Use alcohol of high quality. 2.Clean the electrode and patient's skin where touch the electrode. 3.Charge the battery. 4. Keep the electrode reed clamping.
Baseline drift	1.Power of battery is used up. 2.Patient is moving.	1.Charge the battery. 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 15 Maintenance and Preservation

15.1 Customer is not permitted to open the instrument, in archive of any electronic shock. Any maintenance or update should execute by the trained and authorized professionals from Contec. The maintenance should be done with the original accessories from Contec Medical Systems Company Limited.

15.2 The integrality of the lead cables need to be checked termly. the damage of any a lead may cause corresponding lead or all leads no figure. the lead cables can be cleaned with water and soap, be disinfected with 75% alcohol.

15.3 The electrode should be stored properly and disinfected with 75% alcohol. For the electrode which has used for long time, please replace it.

15.4 Please use the neutral cleanser to clean the device. Don't immerge the device in cleanser.

15.5 Pull out the power plug when power failure. For the device which is not used for long, put it in the shade and dry site, and electrify it every 3 months.

15.6 Regular maintenance is necessary for this device. Please check it every 6 months at least, and measure it every year. For the device which has used/stored for more than one year, please measure it before using again.

15.7 The schematic diagram and key parts list of this device can be only provided to the eligible service station or personnel authorized by our company.

Appendix

Guidance and manufacturer's declaration–electromagnetic emissions-
for all EQUIPMENT and SYSTEMS

<table>
<tr><th colspan="3">Guidance and manufacturer's declaration – electromagnetic emission</th></tr>
<tr><td colspan="3">The ECG300G is intended for use in the electromagnetic environment specified below. The customer of the user of the ECG300G should assure that it is used in such and environment.</td></tr>
<tr><th>Emission test</th><th>Compliance</th><th>Electromagnetic environment –</th></tr>
<tr><td>RF emissions
CISPR 11</td><td>Group 1</td><td>The ECG300G uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.</td></tr>
<tr><td>RF emission
CISPR 11</td><td>Class
A</td><td rowspan="3">The ECG300G is suitable for use in all establishments, other than domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.</td></tr>
<tr><td>Harmonic emissions
IEC 61000-3-2</td><td>Class
A</td></tr>
<tr><td>Voltage fluctuations/
flicker emissions
IEC 61000-3-3</td><td>Complies</td></tr>
</table>

Guidance and manufacture's declaration – electromagnetic immunity – for all EQUIPMENT and SYSTEMS

Guidance and manufacture's declaration – electromagnetic immunity			
The *ECG300G* is intended for use in the electromagnetic environment specified below. The customer or the user of			
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 floor are covered with synthetic material, the relative humidity should be at least 30%.
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 differential mode ±2 kV common mode	±1 kV differential mode ±2 kV common mode	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short 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 *ECG300G* requires continued operation during power mains dip&interruptions, it is recommended that the *ECG300G* be powered from an uninterruptible power supply or a battery.
Power frequency (50/60Hz) magnetic field IEC61000-4-8	3A/m	3A/m	Power frequency magnetic fields Should be at levels characteristic of a typical location in a typical commercial or hospital environment.
NOTE U_T is the a.c. mains voltage prior to application of the test level.			

Guidance and manufacturer's declaration – electromagnetic immunity – for EQUIPMENT and SYSTEMS that are not LIFE-SUPPORTING

<table>
<tr><th colspan="4">Guidance and manufacturer's declaration – electromagnetic immunity</th></tr>
<tr><td colspan="4">The ECG300G is intended for use in the electromagnetic environment specified below. The customer or the user of
ECG300G should assure that it is used in such an environment.</td></tr>
<tr><th>Immunity test</th><th>IEC 60601 test level</th><th>Compliance level</th><th>Electromagnetic environment - guidance</th></tr>
<tr><td>Conducted RF IEC 61000-4-6

Radiated RF IEC 61000-4-3</td><td>3 Vrms
150 kHz to 80 MHz

3 V/m
80 MHz to 2.5 GHz</td><td>3 Vrms

3 V/m</td><td>Portable and mobile RF communications equipment should be used no closer to any part of the ECG300G, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.
Recommended separation distance
$d = \left[\frac{3.5}{V_1}\right]\sqrt{P}$
$d = \left[\frac{3.5}{E_1}\right]\sqrt{P}$ 80 MHz to 800 MHz
$d = \left[\frac{7}{E_1}\right]\sqrt{P}$ 800 MHz to 2.5 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:
  </td></tr>
<tr><td colspan="4">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.</td></tr>
<tr><td colspan="4">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 ECG300G is used exceeds the applicable RF compliance level above, the ECG300G should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the ECG300G.
b Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.</td></tr>
</table>

Recommended separation distances between portable and mobile RF communications equipment and the EQUIPMENT or SYSTEM – for EQUIPMENT or SYSTEM that are not LIFE-SUPPORTING

Recommended separation distances between portable and mobile RF communications equipment and the *ECG 300G*

The *ECG 300G* is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the *ECG300G* can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the *ECG 300G* as recommended below, according to the maximum output power of the communications equipment.

Rated maximum output power of transmitter (W)	**Separation distance according to frequency of transmitter (m)**		
	150 kHz to 80 MHz $d = \left[\frac{3.5}{V_1}\right]\sqrt{P}$	**80 MHz to 800 MHz** $d = \left[\frac{3.5}{E_1}\right]\sqrt{P}$	**800 MHz to 2.5 GH** $d = \left[\frac{7}{E_1}\right]\sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.37	0.37	0.74
1	1.17	1.17	2.33
10	3.69	3.69	7.38
100	11.67	11.67	23.33

For transmitters rated at a maximum output power not listed above, the recommended separation distance d in metres (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

NOTE 1At 80 MHz and 800 MHz, the separation distance for 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.

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.

CE 0123

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

EC REP

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

Explanations of symbols on unit	
	Symbol for "applied parts" (the electrodes are type CF applied parts).
	Symbol for "environment protection" - waste electrical products should not be disposed of with household waste. Please recycle where facilities exist. Check with your local Authority or retailer for recycling advice.
	Symbol for "manufacturer".
	Symbol for "complies with MDD93/42/EEC requirements".
	Symbol for "date of manufacture".
	Symbol for "European representative".
	Symbol for "serial number".

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