Western Surgical®

ECG100G

Electrocardiograph

USER MANUAL

www.westernsurgical.in
Email : westernsurgical@gmail.com
Email : info@westernsurgical.in
Ph. : +91-281-2232871 / 2243159

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:220V，50Hz（110V ,60 Hz）

DC: 7.4V, 3700 mAh rechargeable lithium battery

d) Atmospheric pressure: 86kPa～106kPa

Store and Transportation

a) Environment temperature: -40℃～55℃

b) Relative humidity: ≤95%

c) Atmospheric pressure: 50kPa～106kPa

1.2 Input way: Floating and defibrilation 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）

1.7 Time constant: Time constant>3.2s

1.8 CMRR: ＞60dB, ＞100dB(Add filter)

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

1.10 Recording way: Thermal printing system

1.11Specification of recording paper: 50mm（W)×20m(L) High-speed thermal paper

1.12 Paper speed: 25mm/s、50mm/s，error:±5%

1.13 Sensitivity choice: 5、10、20mm/mV, error:±5%。Standard sensitivity is 10mm/mV±0.2mm/mV

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

1.15 Manual record: according the record format to record, manual leads-changing.

1.16 Classification: Class I, CF applied part

1.17 Enduring polarization voltage：±300mV

1.18Noise level: ≤15μVp-p

1.19 Fuse Specification: 2 pcs φ5×20mm AC time lag; T1.6A/250V(Power Supply:220V)

1.20 Size: 315mm(L)×215mm(W)×77mm(H)

1.21 Net Weight: 2.25Kg

Chapter 2 Security Notice

2.1 Make sure the instrument grounding properly during installation.

2.2 If the ground cable is not integrated, please run the device with battery.

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

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

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 with mature consideration of security, but operator should never neglect attention to device state and patient's situation.

2.7 Please dismantle the battery and pull out power supply plug before cleanout and disinfection of this device.

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

2.9 If use this device with cardiac defibrillator or other electric stimulate devices at same time, please use our company's Ag-AgCl chest electrode and ECG lead, if use the electric stimulate device over 55 seconds, please choose one-off chest electrode. We suggest ECG100G not be used with other electric stimulate device, if it is compulsory, there should be professional technician guided 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 To avoid the danger that the heart pacemaker and other electric stimulate cause ,this system is electric separate ,separating people and the machine electric absolutely.

2.12 Electrocardiograph can indicate abnormal state , caused by overloaded or any part of the amplifier saturation.

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:

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

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

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

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

3.3.5 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 caused by the faults of this device directly or indirectly.

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

3.7 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 Apparatus Characteristic

4.1 Recording system: Thermal-array (8 dots/mm), it needs not be adjusted. Frequency Response:150Hz (IEC).

4.2 The device can record exact single ECG waveform and remark. The remark includes: lead sign, sensitivity, paper speed, filter state.

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

4.4 The keyboard is convenient to operate, and the LCD can display the operation state, which is convenient and readable.

4.5 Classification: Class: I, CF applied part.

4.6 The device can use AC and DC and it includes built-in chargeable lithium battery.

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

4.8 The figure of whole device is elegancy and gliding.

4.9 According to defendence degree of deleterious fluid, this device is belong to common device.

4.10 The device can't be used in the environment, which contain flammable anaesthesia gas mixed with Air.

4.11 Adopting digital signal which deals with the work filter,the baseline filter and the EMG filter will obtain the higher quality of the ECG.

4.12 The device can AUTO print the normal ECG, which can lighten the doctor's burden and enhance your work efficiency.

4.13 According to the working mode class, this device belongs to continuous operation equipment.

4.14 Function: This equipment is digital single channel electrocardiograph, which connects with people though lead wires, filter and amplify the faint signal it gathers ,then transmit to the single chip microcomputer. The single chip microcomputer then processes the signal through some algorithms to get waves to send to the LCD and the printer, which supply to the user.

4.15 Intended use: doctor or professional may diagnose the state of the patient through observing the waves the ECG offers, then take measures according to the result.

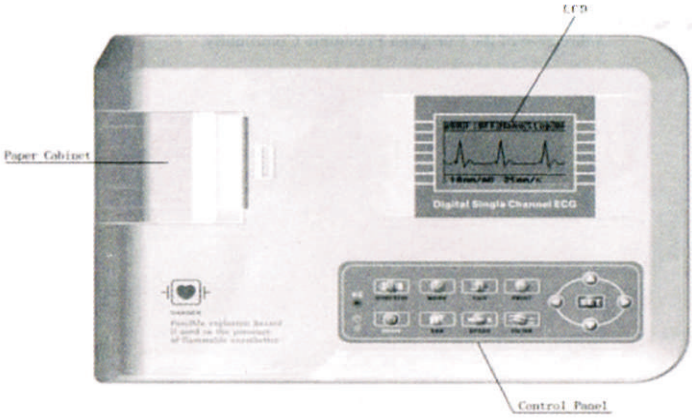
4.16 Explanation of some symbols in this device:

~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 applied part, which has defibrillation protection function
	RS232 connector
	USB connector
	PATIENT Lead connector
	WEEE (2002/96/EC)
CE 0123	This item is compliant with Medical Device Directive 93/42/EEC of June 14, 1993, a directive of the European Economic Community.

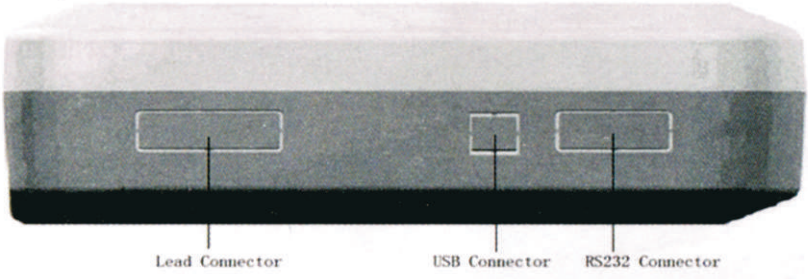
Chapter 5 ECG100G Panel Sketch Map

A The sketch map and components name

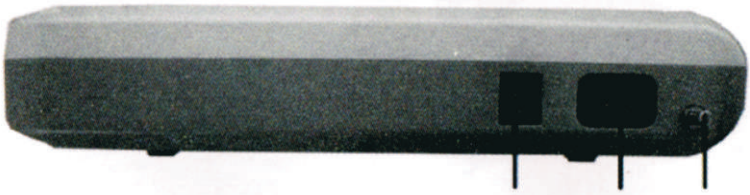
Front view



Side view

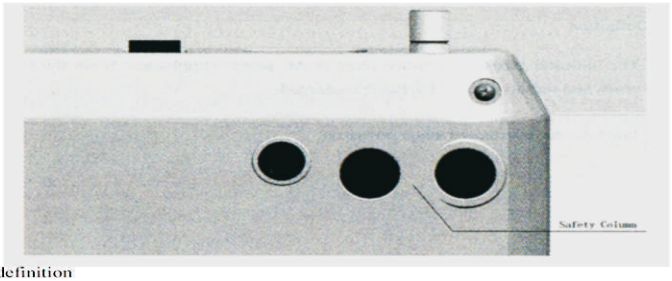


Rear view



Due to constant upgradation design, price and features are subject to change without prior notice.

Bottom view



B Button definition


Function button: ON/OFF & Time Display


Function button: plus adjust

Function button: paper speed adjust


Function button: filter function select


Function button: pause/on


Function button: switch work mode


Function button: marker


Function button: print

Function button: system menu


Function button: upwards


Function button: downwards


Function button: leftwards


Function button: rightwards

C. 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.

Due to constant upgradation design, price and features are subject to change without prior notice.

Chapter 6 Operation Regulation

6.1 You are required to read the operation regulation so as to ensure taking proper operation of the instrument.

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

6.2.1Thereshouldn't have high voltage cable,X radial engine,ultrasound instruments and electrotherapeutics engine around the ECG.

6.2.2 Do not install the instrument in the place where it might be affected by bad humidity and ventilation, direct sunlight, as well as air containing dust, salt, and sulphur, etc.

6.3 The device should be placed in evenness,and move gently,and should avoid the strong vibration and impact.

6.4 AC frequency and voltage value should be accorded with the need and the current capacity should be enough..

6.5 Do the instrument grounding properly during installation.Don't put the patients and the lead which connect with patients contact with other conductors,including the ground or the sickbed which ground properly.

Chapter 7 Preparation Before Operation

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

7.2 Check the electrode which connected with patient safe or not

7.3 When power supply is direct current (UPS), please check the voltage of battery before use.

7.4 The gel should be separated from each other and the chest electrodes shouldn't be contacted with the others,as this operation can avoid short circuit.

7.5 The AC power supply cable and leads should be separated.

Chapter 8 Attention During Operation

8.1 Keep close observation of state of the patient and instrument.

8.2 Make sure that the patient and device only be connected by leads.

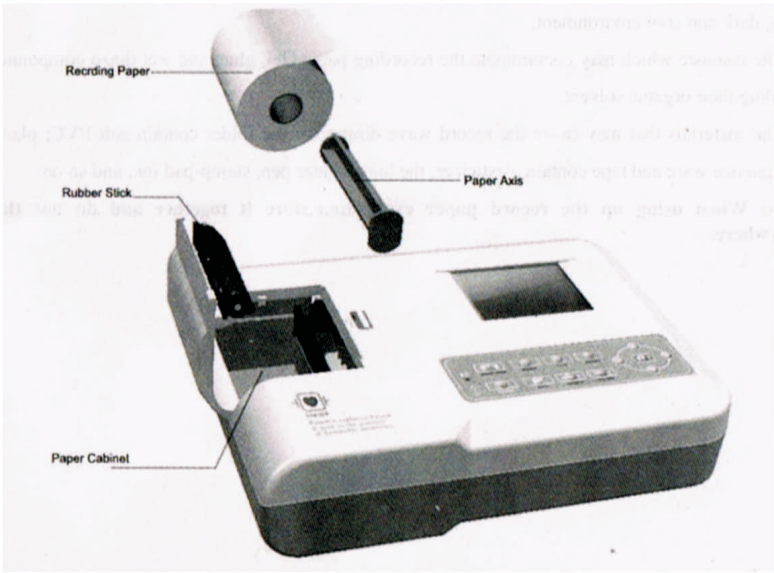
8.3 The device and patient can't be moved during working.

8.4 Turn off device after operation.

8.5 Pull out the power supply plug, then move the leads lightly.

8.6 Tidy up the devices and accessories for next use.

8.7 The installation recording paper.



8.7.1 This device use high-speed thermal paper whose specification is 50mm（W)×20m(L).

8.7.2 First, open the paper cabinet, take out the paper axis, then put the paper axis in recording paper, then put it in the relevant position of paper cabinet.

8.7.3 Cover the paper cabinet with paper cabinet cover, 2cm of the beginning of paper should be left out of the cabinet exit.

Chapter 9 Recording Paper Loading

9.1 If the recording paper is used up during the recording process, the paper record will over, and a notice will be displayed on the LCD screen.

9.2 There is a line at the verge of paper at the last two meters of the recording paper, this line means the paper is not enough, please change the paper immediately. We suggest you choose our company's print paper, as for its detailed information, please consult with our company or agency.

9.3 The possible reason which will make the recording paper disable includes: high temperature, humidity, and sunshine irradiation. The recording paper which needs long time stock should be deposit in dry, dark and cool environment.

9.4 The instance which may contaminate the recording paper.Gel, glue, and wet diazo compound paper including their organic solvent.

9.5 The materials that may cause the record wave disappear: the folder contain soft PVC; plastic; the demagnetize ware and tape contain elasticizer; the high-lighter pen, stamp-pad ink, and so on.

Notes: When using up the record paper every time,store it together and do not throw it everywhere.

Chapter 10 Electrode Installation

You'd better install the chest electrode firstly,then Limb electrode.

10.1 Chest electrode,as shown in figure 10-1

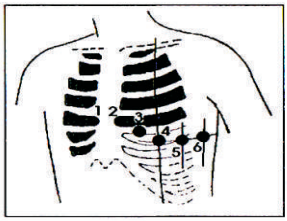


Figure 10-1: chest electrode locations

The position of installing chest electrodes are 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.

Cleaning the chest skin with alcohol,then put the gel in the diameter about 25mm and the edge of the chest electrodes ,press the ball of the chest electrodes,the the chest electrodes will be attracted in the position of V1-V6.

Attention:The chest electrodes should be separated from gel coats, this operation can avoid short circuit.

10.2 Limb electrode

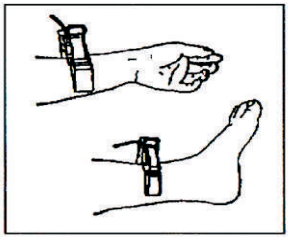


Figure 10-2: Limb electrode locations

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.

Attention: the fix knob should be screwed down tightly after lead connected with main unit.

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	V1/C1	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

Notes: When using up the absorption ball ,clear the clamp used for arms and legs and put on the appointed place to store.

Chapter 11 Grounding And Power Connection

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 garantee the saty and prevent from the interference of AC power and electromagnetic wave.

Chapter 12 Battery Operation Regulation

12.1 This device includes built-in chargeable lithium battery, which needn't maintenance. This battery is with perfect automatic charge and discharge monitoring system. When you connect power supply adapter with alternating current, the charge will be start automatically. When this device be open, an icon ⧖ be displayed on top right corner of LCD screen. ⧖ means the battery is charging. The whole charge process needs four hours.

12.2 When the battery is full, the device can be operated for one hour, when the battery be used as power supply. An icon of battery will be displayed in the LCD screen of front panel, this icon includes five degree indicates power of battery. When the battery is power off, the device will turn off automatically, this setting is for avoiding permanent damage on battery caused by excessive discharge.

12.3 Please charge the battery after power off. When this device be deposit for long time, the battery should be charge once every six months, this operation will prolong the use –pan of battery.

12.4 The icon of seven different state of power supply as following:

⧖	The alternating current is power supply & the battery is full or no battery
🔋	The battery is only power supply and its power is full.
🔋 🔋 🔋	The battery is only power supply and its power is not full
⧖	The battery is only power supply and its power is exhausted.
⧖	Charge up

12.5 If the battery is full, but the power of battery is exhausted within 10 minutes. Please change new battery. If the battery is can't be charged, please change new battery.

12.6 When the icon ⧖ display on screen. Please charge the battery immediately, or the device will turn off.

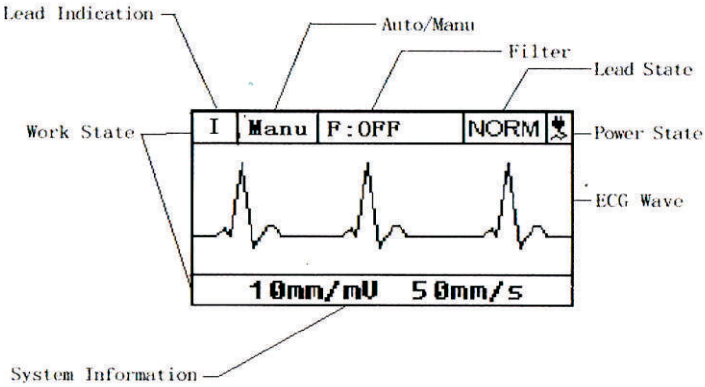
Warning!!!

- Please don't connect the anode and cathode with lead of battery directly, it will cause danger.
- Please don't put the battery on fire. It may cause explosion.
- Please don't disassemble the battery privately.
- The battery should be take gently, please don't strike it with other article.

Chapter 13 Keypad And Controls

13.1 Press power supply key  for several seconds, the device will enter auto-check mode, at this time, the display will be boot-strap menu.

13.2 After auto-check mode, the display as following:



（1） The operation of lead indicate column

Press button  to choose relevant lead, the device will switch to appointed lead check state, it switch among according following order: I II III aVR aVL aVF VI V2 V3 V4 V5 V6.

（2） The operation of system state information column:

Switch by press relevant function key (The function key as following)

Sensitivity: 5mm/mV、10mm/mV、20mm/mV, three kinds of sensitivity in all.

Switch Mode: MANU,AUTO.

Under AUTO-MODE, the device will note 12 leads, 3 second ECG signal every lead.

Filter: OFF、50Hz、60Hz、50Hz+、60Hz+, five filter mode in all.

The mode of 50Hz+ & 60Hz+ mean open 35Hz EMG filter.

Attention:The range of recording R wave will be fallen a little,which caused by attaching the EMG filter.

Speed: 25mm/s、50mm/s. two kind of paper speed in all.

（3） Leads state indication.

When the leads state is "NORM" , you can print the ECG.

When the leads state is "OVER", you can't print the ECG, please check whether electrodes are palced well.Stop printing and print date again after collecting the wave.

When the leads state is "SAT", printed ECG is disordered,please check whether electrodes

are palced well.Stop printing and print date again after collecting the wave.

When the leads state is "DROP",leads shown on the screen have been off .Please reconnect them .

(4) Print operation

Press [ ] under this state, you can start print system setup and ECG wave, press [ ] again the device will be turned off.

Attention: when the paper cabinet is empty, press [ ] or [ ], the device will indicate no paper, please put in the paper then press [ ].

(5) Mark operation

Press [ ] you can print a 1mv standard voltage marker, which is helpful to know current sensitivity.

Attention: the marking procedure is automatically, after this procedure you need not press any key, the interface will be back automatically.

(6) Operation of waveform frozen

Press [ ] you can freeze current waveform in LCD screen, which is helpful for preview. Press [ ] again, back to previous interface.

(7) Operation of turning off

Press [ ] for several seconds, the device will be turned off.

13.3 System menu

Menu	
Backlight	99s
Contrast	10
Language	English
Demo	ON
About	Ver.

English version

菜单	
背光	99s
对比度	10
语言	中文
演示模式	ON
关于	版本号

Chinese version

（1） Operation of menu

Press SET to enter above interface, you can choose relevant item by press ▽ △, then you can press ◁ ▷ to adjust the content, after setup, press SET to be back.

（2） Introduction of every item

Backlight: 0-99seconds, back light start time, when choosing 0s, the back light will be turned off, when choosing 99s, the backlight will be turned on for 99s.

Contrast: 00-20, please choose different contrast degree according to different device state.

Language: Several languages interface can be chosen ,such as ENGLISH and CHINESE

Demo: ON、OFF, if you need not inspection practice, just choose ON for demo.

About: Software Version.

Chapter 14 Troubleshooting

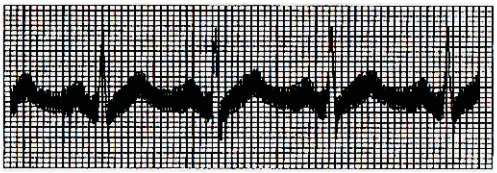
14.1 Automatic Switch off

① Please check whether the power of battery is used up. Turn off is for protecting circuit.

② Please check whether the alternating current voltage is too high, Turn off is for protecting circuit.

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

14.2 AC interference



① Is the ECG device ground cable proper?

② Is the electrode and leads' ground cable proper?

③ Is the electrode and skin covered with enough Gel?

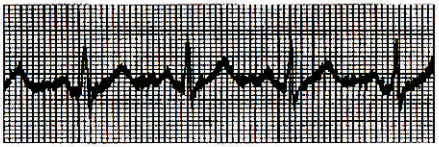
④ Is the metal bed grounding proper?

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

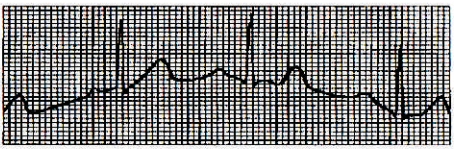


① Whether the patient room is comfortable.

② Is the patient nervous?

③ Is the sickbed too narrow?

14.4 Baseline drift



① Is the installation of the electrode instablity?

② Is the connection between leads and electrodes credibility?

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

[redacted].Does it cause by the patients'moving or breathing?

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 too strong. 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 volatiled. 2·Use the appointed thermal print paper.

Chapter 15 Maintenance Transportation 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 authorised professionals from our company .The maintenance should be done with the original accessories from our company.

15.2 Please pull out the power supply plug when power off. If the device out of use for long time, please put the device in a shady cool dry place, and the device should be charged once every three months.

Appendix

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

Guidance and manufacture's declaration – electromagnetic emission		
The *ECG100G ECG* is intended for use in the electromagnetic environment specified below. The customer of the user of the *ECG100G ECG* should assure that it is used in such and environment.		
Emission test	**Compliance**	**Electromagnetic environment – guidance**
RF emissions CISPR 11	Group 1	The *ECG100G ECG* 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.
RF emission CISPR 11	Class A	The *ECG100G ECG* 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.
Harmonic emissions IEC 61000-3-2	Class A	
Voltage fluctuations/ flicker emissions IEC 61000-3-3	Complies	

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

Guidance and manufacture's declaration – electromagnetic immunity			
The *ECG100G ECG* is intended for use in the electromagnetic environment specified below. The customer or the user of *ECG100G ECG* should assure that it is used in such an environment.			
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 ±1 kV for signal lines	±2 kV for power supply lines ±1 kV for signal 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 *ECG100G ECG* requires continued operation during power mains dip & interruptions, it is recommended that the *ECG100G ECG* 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 manufacture's declaration – electromagnetic immunity – for EQUIPMENT and SYSTEMS that are not LIFE-SUPPORTING

Guidance and manufacture's declaration – electromagnetic immunity

The *ECG100G ECG* is intended for use in the electromagnetic environment specified below. The customer or the user of *ECG100G ECG* should assure that it is used in such an environment.

Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment - guidance
			Portable and mobile RF communications equipment should be used no closer to any part of the *ECG100G ECG*, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. **Recommended separation distance**
Conducted RF IEC 61000-4-6	3 V_{rms} 150 kHz to 80 MHz	3 V_{rms}	$d = \left[\frac{3.5}{V_1}\right]\sqrt{P}$
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2.5 GHz	3 V/m	$d = \left[\frac{3.5}{E_1}\right]\sqrt{P}$ 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: 

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 *ECG100G ECG* is used exceeds the applicable RF compliance level above, the *ECG100G ECG* should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the *ECG100G ECG*.

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

Recommended separation distances between portable and mobile

Due to constant upgradation design, price and features are subject to change without prior notice.

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 *ECG100G ECG*

The *ECG100G ECG* is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the *ECG100G ECG* can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the *ECG100G ECG* 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 GHz $d = \left[\frac{7}{E_1}\right]\sqrt{P}$
0.01	0.117	0.117	0.233
0.1	0.369	0.369	0.738
1	1.17	1.17	2.333
10	3.69	3.69	7.379
100	11.7	11.7	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 1 At 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.

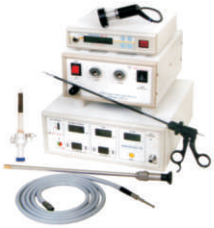
Date of Installation	**Installed By**
Model No.	**Serial No.**
Warranty Period	
Name of Doctor & Address :	

Customer Sign. With Stamps

Marketed By: Western Surgical
Sign. With Stamps

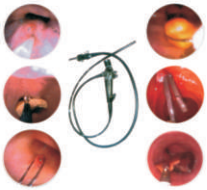
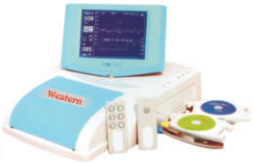
No Claim Warranty :
1) Any Defect Througut Power Supply
2) Any Physical Damage
3) Under Warranty Standby Unit Not give
4) Under Warranty When Company Send Parts or Machine we Imidiat send to Buyer.

OUR OTHER PRODUCTS RANGE












Due to constant upgradation design, price and features are subject to change without prior notice.

Western Surgical®

"Happy Home", 2nd Floor, 23, Karanpara,
B/h. S.T. Bus Stand, Kanak Road,
Rajkot-360 001. Ph. : 0281-2232871/2243159
Mo. : 98250 69069 - 98250 45997
Email : westernsurgical@gmail.com
Email : info@westernsurgical.in

* www.westernsurgical.in *