AUTOMATIC DIGITAL BLOOD PRESSURE MONITOR

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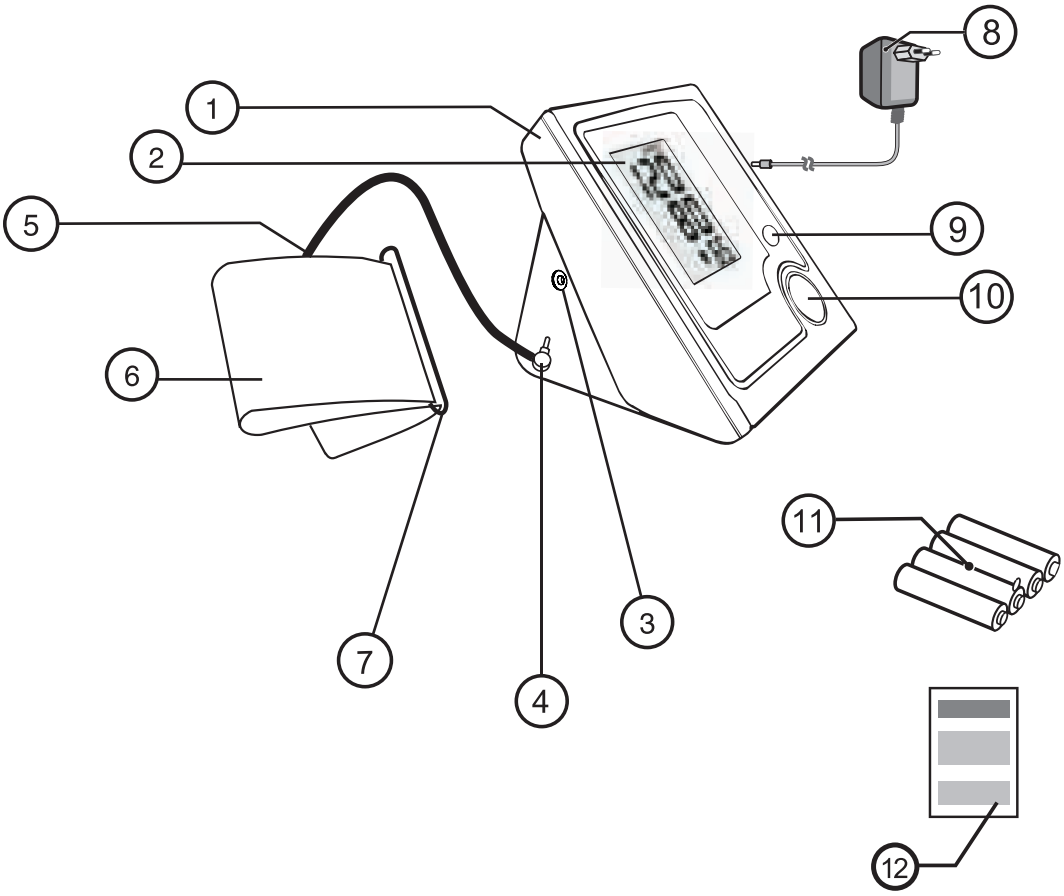
INSTRUCTION MANUAL
Model: LD-578

PARTS AND COMPONENTS



1.Main Body
2.Display
3.Air Connector
4.Tube Plug
5.Air Hose
6.Cuff
7.D-ring
8.AC Power Adapter (Optional)
9.Memory Button
10.O/I Button
11.Batteries
12.Instruction Manual

SYMBOLS

SYMBOLS	MEANING
	Manufacturer
EC REP	Authorized Representative in the European community
	Symbol for the marking of electrical and electronics devices according to Directive 2002/96/EC. The device, accessories and the packaging have to be disposed of waste correctly at the end of the usage. Please follow Local Ordinances or Regulations for disposal.
CE 0123	CE marking in conformity with EC directive 93/42/EEC
	Attention, consult accompanying documents
	Type B Applied Part

TABLE OF CONTENT

GENERAL

This instruction manual is intended to assist the user for safe and efficient operation of the automatic digital blood pressure monitor (hereinafter: device) model LD-578. The device must be used in accordance with the procedures described in the manual. It is important to read and understand the entire manual, especially the section <Tips on taking blood pressure measurement>.

This device is intended for the non-invasive measurement of systolic and diastolic arterial blood pressure and pulse rate in adults（age 15 and above）. Consult the physician if measurement is taken in children or persons with arrhythmia as errors may occur.

PRINCIPLE OF OPERATION

This device adopts the oscillometric technology with Fuzzy Algorithm measuring the arterial blood pressure and pulse rate. The cuff is wrapped around the arm and automatically inflated by the air pump. The sensor of the device catches weak fluctuation of the pressure in the cuff produced by extension and contraction of the artery of the arm in response to each heartbeat. The amplitude of the pressure waves is measured, converted in millimeters of the mercury column, and is displayed by digital value.

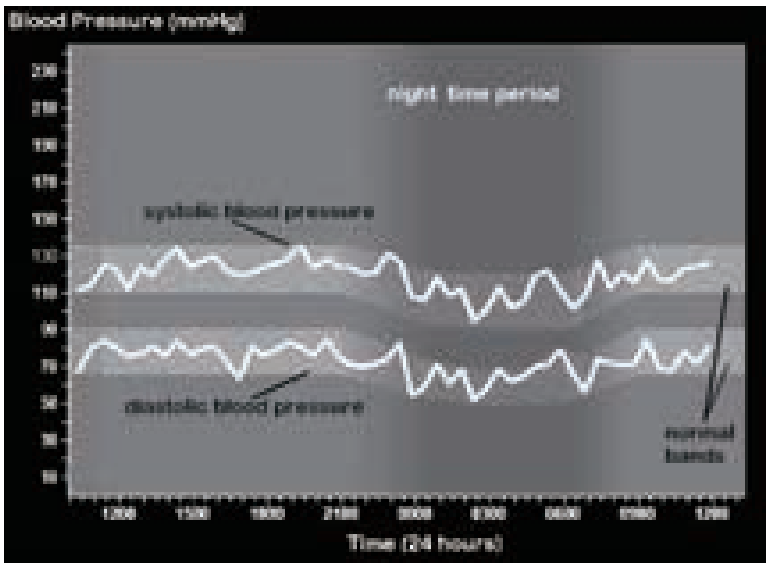
Annotation: This device can not provide reasonable accuracy if used or stored in the temperature or humidity beyond the range stated in the section <SPECIFICATIONS> of this manual.

NEW LD TECHNOLOGIES USED

Fuzzy Algorithm is the processing algorithm taking into account of the speciality of individual heartbeats, which provides higher accuracy of measurement.

TIPS ON TAKING BLOOD PRESSURE MEASUREMENT

1.It is necessary to know that arterial blood pressure is subjected to sharp fluctuations. The level of the arterial blood pressure depends on many factors. Generally arterial blood pressure is lower in summer and higher in winter. Arterial blood pressure changes with atmosphere pressure and is affected considerably by many factors, e.g. physical loads, emotional excitability, stress, meals, etc. Medicines, drinking, smoking affects greatly the level of individual blood pressure. When blood pressure is measured in hospital, the value is always higher than that at home. The reason is the tensity and such case is especially serious in given group patients, which is known as 'White coat effect' medically. Blood pressure will raise in low temperature, so it is better to take blood pressure measurement in room temperature (approximately 20℃). If this device was stored in low temperature, it is necessary to leave it in room temperature for at least 1 hour, otherwise the measurement can be inaccurate. Blood pressure does vary with age and individual, and it is recommended to write down the readings in blood pressure record daily, then you can check with your doctor to find out what is "normal blood pressure" for you.



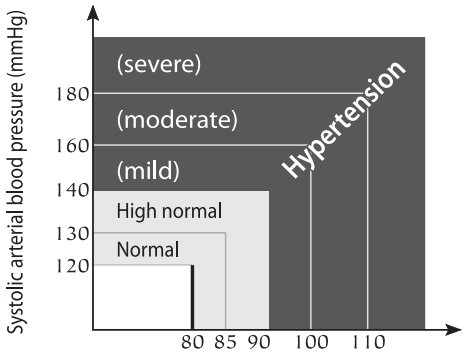
The illustration is from British Hypertension Society

2.Take measurement under doctor's instruction for patients with cardio-vascular diseases.

Under no circumstances should you alter the dosages of any drugs prescribed by your doctor!

3.Accurate measurement of blood pressure may be difficult in serious arteriosclerosis, weak pulse, or in patients with obvious fluctuation of heart contraction rhythm. Please consult qualified physician interpret your blood pressure readings.

4.It is necessary to keep quiet during measurement to get accurate readings. Measure-ment should be conducted in quiet environment at room temperature. Don't eat or smoke before a measurement.



Arterial blood pressure classification by World Health Organizatior

This device is supplied with the standard cuff and large adult cuff which are fit for the arm circumference 22-32cm and 32-43cm. Care should be taken to ensure that the cuff sizes are appropriate for the person whose blood pressure is being taken. Children and adults with cuff size fall outside the range of the standard cuff size and large adult cuff size should select special size cuffs. Please contact the dealer to get these special size cuffs.

ATTENTION: Do not use cuffs other than the original cuff contained in this kit!

5.Repeated measurements with interval at 3 minutes are recommended, so you can calculate the average to get more accurate measurement. Athero-sclerosis patients are required longer interval (10-15 minutes) as elasticity of patients' vessels decreased significantly in these diseases. 10-15 minutes interval is also applicable for patients suffering from diabetes for a long time.

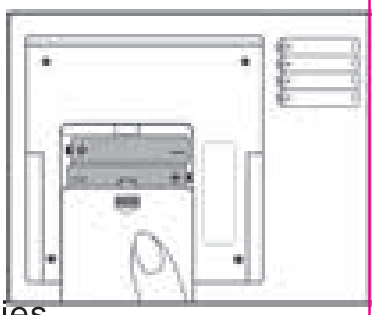
CLASSIFICATION

- Equipment not suitable for use in the presence of flammanle mixures.
- Internally powered equipment.
- Type B applied part.

BATTERY INSTALLATION

1.Open the battery cover and install four 'AA' type batteries into the battery compartment as indicated. Make sure that the polarity is correct;

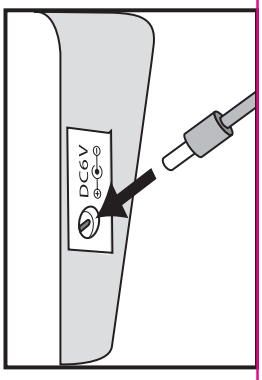
2.Close the battery compartment cover.



- Replace the batteries when the replacement indication " ▭ "appears in the display or nothing after O/I button is pressed;
- Batteries in this kit are intended to check work capacity of the device and the life-span of the batteries can be shorter than the recommended;
- Use only R6P， LR6 AA alkaline batteries, do not use rechargeable batteries;
- Only same type batteries are allowed to use together. Replace all batteries simultaneously;
- If the device is to be unused for long time, please take out the batteries;
- Don't leave the worn batteries in the device.

USE THE DEVICE WITH AC POWER ADAPTER

Besides batteries you can use AC power adapter as the power supply. AC power adapter is optional for the device for sale.



- Insert the AC adapter cord into the jack on the left side of the monitor.
- Insert the AC adapter plug into the outlet.
- To remove the AC adapter, disconnect the adapter plug from the AC outlet first and then disconnect the cord from the monitor's jack.

Caution

●When using optional AC adapter, the AC adapter must comply with the requirements of standard IEC60601-1:1995.

●To avoid possible damage to the monitor, use only the exclusive AC adapter that can be purchased from authorized dealers. Other adapter may damage the blood pressure monitor.

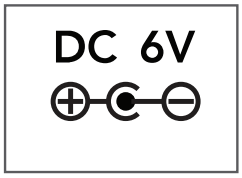
Note: The monitor is designed not to draw power from the batteries when the AC adapter in use.

Optional AC Adapter technical feaure

Output voltage: 6V±5%

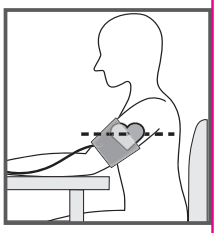
Max. output current: At least 600 mA

Output plug polarity: <-> inner

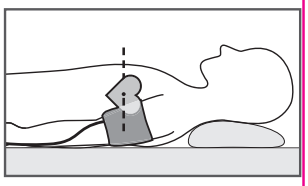


CORRECT POSTURE FOR MEASUREMENT

1.Sit at the table and let the table support your arm as you take the measurement. Make sure that the cuff on the upper arm is at approximately the same level as the heart, and that the forearm is extended naturally on the table;

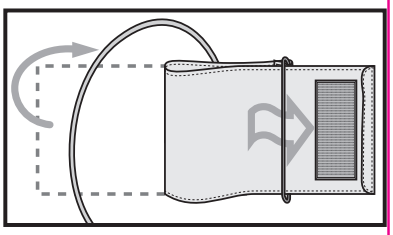


2.You may lie on your back and take measurement. Look at the ceiling, keep calm, and don't move your neck or body during the measurement. Make sure that the cuff on the upper arm is at approximately the same level as the heart.

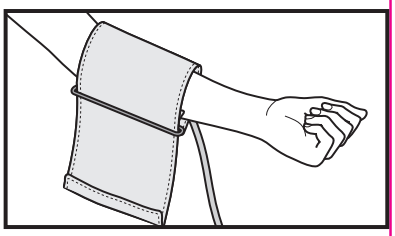


ASSEMBLY THE CUFF

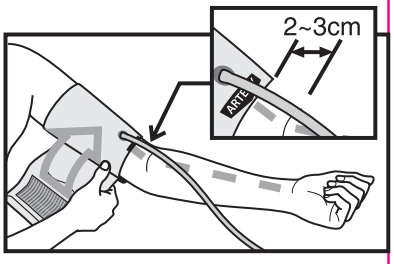
1.Insert the edge of the cuff approximately 5 centimeters into the D-ring as shown in figure.



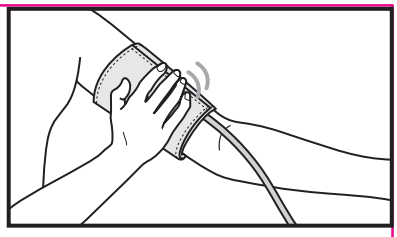
2.Put the cuff on the left upper arm with the tube pointing to the direction of palm. If measurement on your left arm is difficult, you can use right arm for measurement. In this case, it is necessary to know that the readings may differ about 5-10 mmHg between left arm and right arm.



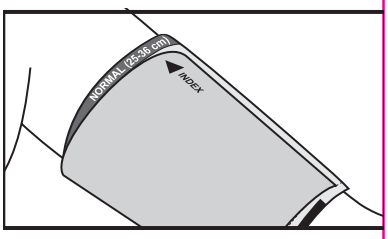
3.Wrap cuff around your upper arm with the lower edge of the cuff approximately 2-3 centimeters above the elbow. The mark <**ARTERY**> must be over the artery of the arm.



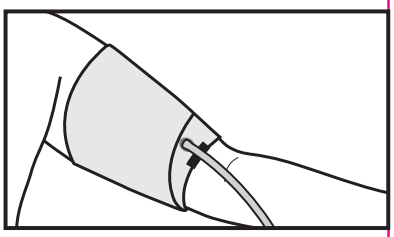
4.Press the cuff to make sure that it is attached securely. The cuff should not be too tight or too loose. Two fingers should be easily put in between cuff and upper arm.



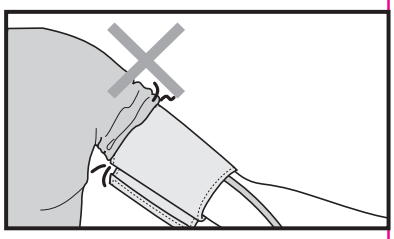
5.The mark <**INDEX**> on the cuff must point to area <**NORMAL**> or <**LARGE CUFF**>. This means the cuff size is correct. If mark <**INDEX**> points to the area beyond area <**NORMAL**> or <**LARGE CUFF**>, please consult your dealer whether you need another size cuff.



6.Sometimes it is difficult to make the cuff regular owning to the shape of the user's upper arm, the cone-shape assembly of cuff is also acceptable.



7.If your clothes restrict blood circulation of your upper arm, or you roll your sleeve up so as to result in such restriction. Please take off your clothes to get accurate measurement if necessary.



CARRY OUT A MEASUREMENT

1.Insert the tube plug into the air connector.
Before the measurement, take 3~5 times deep breath and relax yourself. Don't talk or move your arm;

Fig. 1

2.Press button 'O/I', and all symbols will appear on display in 2 seconds as Fig.1. Then two short beep will sound and '0 mmHg' will appear on the screen. Pump begins to inflate with display showing the reading of pressure. Generally the pressure will reach 190 mmHg as Fig.2;

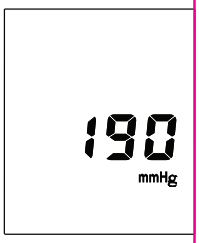


Fig. 2

3.The pump stop inflating and pressure begins to decrease gradually, during which the user's blood pressure and pulse will be calculated as Fig.3;

4.There will be a long beep following the accomplishment of measurement. The air in the cuff will deflate quickly and the blood pressure reading, pulse reading will show in the display as Fig.4;

Fig. 3

5.Press the button 'O/I' to turn off the device. Please rest for at least 3 minutes for another measurement. If the power supply is not switched off and the device keeps unused for 3 minutes, the device will be switched off automatically.

Fig. 4

AUTOMATIC INFLATION

There are 4 given levels of given inflation pressure for this device: 190mmHg, 230mmHg, 270mmHg and 300mmHg. When 190mmHg is not enough or movement of arm occurs, the device will automatically inflate to reasonable pressure level to ensure a successful measurement. It is not a fault.

RAPID DEFLATION DURING MEASUREMENT

If you do not feel well during measurement or want to stop the measurement for some reason, you can press the O/I button. The device will quickly release the air in cuff and the device will be switched off.

FUNCTION OF MEMORY

MEMORY RECALL

1.LD-578 can store 90 sets of readings and automatically calculate the average value of the latest 3 readings. When the memory is full (90 sets of readings are stored), the oldest reading will be replaced by new one automatically. Memory will not clear away even if power supply is removed;

2.After a measurement or when the device stands by, the user can press Memory button to recall memory. Press Memory button, the display will show the average value of the latest 3 readings as Fig. 5;

3.Press again, the display will show '01', which means the latest reading as Fig. 6;

4.Press again, the display will show '02', which means the second to the last reading...

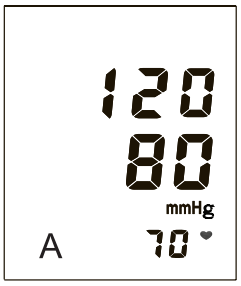


Fig. 5

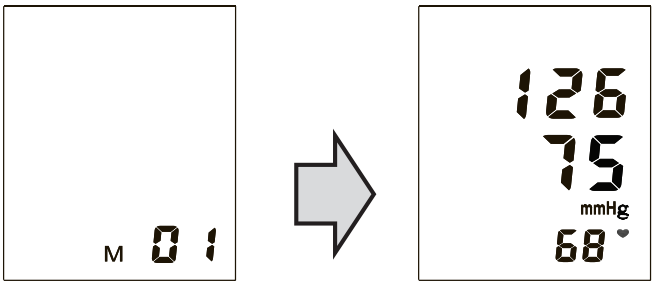


Fig. 6

MEMORY CLEARANCE

After a measurement or when the device stands by, hold down Memory button for at least 5 seconds, the display will show 'CLR' which means the stored readings are removed as Fig. 7.

Fig.7

ERROR AND LOW BATTERY INFORMATION

INDICATION	POSSIBLE REASON	CORRECTION METHODS
	The cuff is put on wrongly or the tube plug is inserted too loosely.	Make sure that cuff is put on correctly and the tube plug is inserted tightly and repeat the measurement
	Movement of arm/hand or talking during measurement.	Repeat the measurement with following completely recommendations of manual.
	The cuff is not inflated to necessary pressure.	Repeat the measurement with pumping cuff to higher pressure
	Arrhythmia	Consult your personal physician
	The batteries are weak	Replace all 4 batteries with new ones

CARE, STORING, REPAIR AND RECYCLING

1.It's necessary to protect this device against high moisture, direct sunlight, shock, solvent, alcohol and gasoline.

2.Remove the batteries if the device is to be stored for a long time, and keep the batteries far from the children.

3.Keep the cuff from sharp subject and don't extend or twist the cuff.

4.Use only soft and dry cloth to clean the device.

5.The cuffs are sensitive and must be handled with care. You can clean the cuff cover with damp cloth as daily maintenance.

To avoid across infection when share the cuff, you can sanitary treatment of inner side of fabrics cover of the cuff and contacting with help of cotton wool tampons, moistened by 3% solution of hydrogen dioxide. After long using, it is allowed partial discoloration of fabrics covering of the cuff. It is not allowed the laundry of the cuff, as well as ironing by hot flatiron.

WARNING: Under no circumstances may you wash the inner bladder!

6.Since neither the device nor batteries are household waste, follow your local recycling rules and dispose them at appropriate collection sites.

7.Do not open the device. It is delicate electrical components and an intricate air unit that could be damaged. If you can not fix the problem using the troubleshooti -ng instruction, request service from your dealer.

8. It is generally recommended to have the monitor inspected every 2 years, to ensure proper functionging and accuracy and safety,.Please contact your dealer for maintenance. **WARNING: Do not modify this equipment without authorization of the manufacturer.**

TROUBLESHOOTING

SYMPTOM	CHECK POINT	REMEDY
No display when the O/I button is pressed.	The batteries have run down	Replace all the batteries with new ones·
	The polarity of battery is wrong	Install the batteries correctly.
	The contact of battery compartment is polluted	Clean the battery terminals with dry cloth.
Inflation stops and re-inflate later	The automatic inflation for ensuring correct measure-ment	See<AUTOMATIC INFLATION>
	Did you talk or move your arm (or hand) during measure-ment?	Keep quiet and silent during the measurement
The reading is extremely low or high.	Is the cuff at the same level as the heart	Make sure that your posture is right
	Is the cuff wrapped right?	Wrap the cuff correctly
	Did you strain your arm during measurement?	Relax during measurement
	Did you talk or move your arm (or hand) during measure-ment?	Keep quiet and silent during the measurement
Pulse rate is too low or too high	Did you talk or move your arm (or hand) during measure-ment?	Keep quiet and silent during the measurement
	Did you make measurement right after exercise?	Take measurement again after resting for more than 5 minutes
The batteries are run down soon	Faulty batteries are used	Suggest to use alkaline batteries of known manufacturers
The device is automatically turned off	It is the result of automatically turn off system	This is to save the power consumption of the device, and it is not a fault.

WARRANTY OBLIGATIONS

1. Warranty for this automatic digital blood pressure monitor is 24months. The 24months warranty excludes the monitor cuff.The cuff is warranted for 12months period.
2. The warranty obligations are prescribed by warranty certificate for buyer.
3. The addresses of organizations for guarantee maintenance are present in the warranty certificate.

SPECIFICATIONS

Model	LD-578
Size	120(L) ×117(W) ×116(H)mm
Weight	Approximately 316g without batteries
Measuring method	Oscillometry
Measuring range	40 to 260 mmHg (blood pressure) 40 to 160 beats/minute (pulse rate)
Measuring accuracy	± 3 mmHg for static pressure ± 5% of the reading for the pulse rate
Inflation	Automatic by the pump
Rapid deflation	Automatic electronic valve
Batteries	4“AA”×1.5V
Adapter	Optional component, 6V, 600mA
Memory	90 sets of memories
Operation temperature and humidity	+10℃ to + 40℃, 85% and below
Storage and transport temperature and humidity	-20℃ to + 50℃, 85% and below
Upper arm circumference	Applicable for arm circumference 22-32cm (standard cuff); 32-43cm(large adult cuff)
Complete kit	Main body, standard cuff, large adult cuff(optional),4×AA batteries (optional), adapter(optional), instruction manual, warranty card

LITTLE DOCTOR ELECTRONIC (NANTONG) CO., LTD
Address: No.8, Tongxing Road, Economic&Technical Development Area, Nantong City, Jiangsu, P.R.CHINA

EC REP **SHANGHAI INTERNATIONAL TRADING CORP. GMBH (HAMBURG)**
Address:Eiffestrasse 80, 20537 Hamburg，Germany

BLOOD PRESSURE RECORD

DATE	SYSTOLIC (mmHg)	DIASTOLIC (mmHg)	PULSE (beats/minute)

Guidance and manufacturer's declaration – electromagnetic immunity

The model LD-578 Digital Blood Pressure Monitor is intended for use in the electromagnetic environment specified below. The customer or the user of the model LD-578 Digital Blood Pressure Monitor should assure that is used in such an environment.

Emission test	Compliance level	Electromagnetic environment-guidance
RF emissions CISPR 11	Group 1	The model LD-578 Digital Blood Pressure Monitor uses RF energy only for its internal function. Therefore, its RF emissions are very low and aren't likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class B	The model LD-578 Digital Blood Pressure Monitor is suitable for use in all establish-ments, including domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emission IEC 61000-3-2	Class A	
Voltage fluctuations/ flicker emissions IEC 61000-3-3	Complies	

Guidance and manufacturer's declaration – electromagnetic immunity

The model LD-578 Digital Blood Pressure Monitor is intended for use in the electromagnetic environment specified below. The customer or the user of the model LD-578 Digital Blood Pressure Monitor should assure that 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	Floor should be wood, concrete or ceramic tile. If floors 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	±1 kV differential 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 UT) for 0.5 cycle 40% U_T (60% dip in UT) for 5 cycles 70% U_T (30% dip in UT) for 25 cycles <5% U_T (>95% dip in UT) for 5 sec	<5% U_T (>95% dip in UT) for 0.5 cycle 40% U_T (60% dip in UT) for 5 cycles 70% U_T (30% dip in UT) for 25 cycles <5% U_T (>95% dip in UT) for 5 sec	Mains power quality should be that of a typical commercial or hospital environment. If the user of the LD-578 Digital Blood Pressure Monitor Equipment requires continued operation during power mains interruptions, it is recommended that the LD-578 Digital Blood Pressure Monitor Equipment be powered from an uninterruptible power supply or a battery.
Power frequency 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.

Guidance and manufacturer's declaration – electromagnetic immunity

The model LD-578 Digital Blood Pressure Monitor is intended for use in the electromagnetic environment specified below. The customer or the user of the model LD-578 Digital Blood Pressure Monitor should assure that is used in such an environment.

Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment-guidance
Conducted RF IEC 61000-4-6	3Vrms 150 kHz to 80 MHz	3 Vrms	Portable and mobile RF communications equipment should be used no closer to any part of the LD-578 Digital Blood Pressure Monitor Equipment, 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). [b] Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey,c should be less than the compliance level in each frequency range.[d] Interference may occur in the vicinity of equipment marked with the following symbol:
Radiated RF IEC 61000-4-3	10 V/m 80 MHz to 2.5 GHz	3 V/m	

Note 1 At 80MHz and 800MHz, 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 strength from fixed transmitters, such as base stations for radio 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 Model LD-578 Digital Blood Pressure Monitor is used exceeds the applicable RF compliance level above, the Model LD-578 Digital Blood Pressure Monitor should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the Model LD-578 Digital Blood Pressure Monitor.

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

Recommended separation distances between portable and mobile RF communications equipment and the LD-578 Digital Blood Pressure Monitor

The LD-578 Digital Blood Pressure Monitor is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the LD-578 Digital Blood Pressure Monitor can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the LD-578 Digital Blood Pressure Monitor 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	1.167	1.167	2.333
10	3.689	3.689	7.379
100	11.667	11.667	23.333

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. Electro-magnetic propagation is affected by absorption and reflection from structures, objects and people.

The manufacturer reserves the right to make technical changes without notice in the interest of progress.
Prior notices will not be given in case of any amendments within this manual. The mentioned trademarks and names are owned by the corresponding companies.


MADE IN CHINA

P578/1101/01