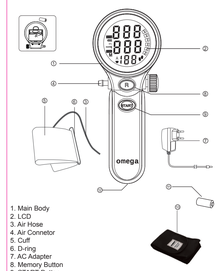
AUTOMATIC DIGITAL BLOOD PRESSURE MONITOR

OMEGA

INSTRUCTION MANUAL
MODEL:LD-528

PARTS AND COMPONENTS



1. Main Body
2. LCD
3. Air Hose
4. Air Connetor
5. Cuff
6. D-ring
7. AC Adapter
8. Memory Button
9. START Button
10. Storage Bag
11. Rechargable Li-ion battery
12. Adapter Outlet

SYMBOLS

SYMBOLS	MEANING
	Manufacturer
EC REP	Authorized Representative in the European community
	Symbol for the marking of electrical and electronic devices according to Directive 2002/96/EC. The device, accessories and the packaging must be disposed of correctly at the end of 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 BF applied part

TABLE OF CONTENT

1. GENERAL 4
- Principle of operation 4
- New technologies used 4
2. TIPS ON TAKING BLOOD PRESSURE MEASUREMENT 5
3. BATTERY INSTALLATION 7
4. HOW TO USE THE POWER SUPPLY 7
- Charging 7
- Battery Change 8
5. CORRECT POSTURE FOR MEASUREMENT 8
6. ASSEMBLING OF THE CUFF 8
7. CARRYING OUT A MEASUREMENT 9
- Automatic Inflation 10
- Rapid deflation during measurement 10
8. WHO BLOOD PRESSURE CLASSIFICATION INDICTION 10
9. FUNCTION OF MEMORY 11
- Memory Recall 11
- Memory Clearance 11
10. ERROR INFORMATION 12
11. CARE, STORAGE, REPAIR AND RECYCLING 13
12. TROUBLESHOOTING 14
13. WARRANTY OBLIGATIONS 14
14. SPECIFICATIONS 15
15. BLOOD PRESSURE RECORD 16

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-528. 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.

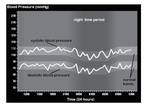
⚠ **ATTENTION:** This device can not provide reasonable accuracy if used or stored in the temperature or humidity beyond the range stated in the section < SPECIFICATIONS > of this manual.

NEW TECHNOLOGIES USED

Fuzzy Algorithm is the processing algorithm taking into account 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, the arterial blood pressure is lower in summer and higher in winter. Arterial blood pressure changes with atmospheric pressure and is affected considerably by many factors, e.g. physical loads, emotional excitability, stress, meals, etc. Medicines, drinking and smoking greatly affects the level of individual blood pressure. When blood pressure is measured in the hospital, the value is always highers than that at home. The reason is the tensity and such case is especially serious in given group patients, which is known as the "White coat effect; medically. Blood pressure will rise in low temperature, so it is better to take blood pressure measurements at room temperature (approximately 24). If this device was stored in a low temperature environment, it is necessary to leave it in room temperature for at least 1 hour otherwise the measurement can be inaccurate. Blood pressure varies with age and individuals. It is recommended to record the blood pressure readings daily.



The illustration is from the British Hypertension Society.

2. Patients with cardio-vascular diseases should take measurement under doctor's instructions.
Under no curcumstances 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 a qualified physician to interpret your blood pressure readings.

4. It is necessary to keep quiet during measurement to get accurate readings. Measurement should be conducted in a quiet environment at room temperature. Do not eat or smoke before a measurement. This device is supplied with the standard adult cuff which fits arm arm size of 22 - 32 cm. Care should be taken to ensure that the cuff size is appropriate for the person whose blood pressure is taken. Children and adults with cuff sizes falling outside the range of the standard cuff size should use a special sized cuff. Please contact the dealer to get these special sized cuffs.

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

5. Repeated measurements are recommended at an interval of 3 minutes in order to calculate the average for more accurate measurement. Atherosclerosis patients require longer intervals (10 - 15 minutes) as elasticity of patients' vessels decreases significantly in these diseases. 10 - 15 minutes intervals are also applicable for long term diabetes patients.

Classification:
- ◆ Equipment not suitable for use in the presence of flammable mixtures.
- ◆ Internally powered equipment.
- ◆ Type B applied part.

BATTERY INSTALLATION

1. Open the battery cover and install the lithium battery into the battery compartment as indicated. Make sure the polarity is correct.

2. Close the cover of the battery compartment.
- If the device is to be unused for long periods of time, remove the batteries.
- Do not leave worn batteres in the device.

HOW TO USE THE POWER SUPPLY

This device uses rechargable batteries or adapter as the power supply:

AC Adapter	**Rechargeable Battery (Lithium Battery)**
Output voltage: 5V±5%	Voltage: 3.7V
Max. output current: At least 1000 mA	Capacity: 650mAh
Output plug polarity: <•> inner	Size: 123A

Don't use battery or adapter not specified for this device!
The battery is not charged when you purchase the device. Connect the device to the AC adapter to charge the new battery for more than 4 hours before use. Even if no battery is installed, this device can still work with the adapter.

Charging
Please charge the battery with the adapter when there is low battery indication ' CE ' flashing or ' ▭ ' in the LCD or nothing after START button is pressed. When the adapter is connected, the adapter will charge the installed rechargeable battery automatically. At the same time the LCD will show ' OK → CK → CK → ▭ ▭ circularly. Once the battery is fully charged, ' OK ' will show in the LCD.

Battery Change
The device can provide at least 200 times measurement with battery fully charged. Approximate life for the rechargeable battery is 2 years, and when the icon ' CK ' appears frequently even you charge it timely, please change the rechargeable battery with new one.
1.Open the battery cover and install the rechargeable battery specified into the battery compartment as indicated. Make sure that the polarity is correct;
2.Close the battery compartment cover.

Caution:
Disposal of discarded battery should be in accordance with local regulations.

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

2.Press button 'START', and all symbols will appear on display in 2 seconds. 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 190mmHg;

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

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;

5.Press the button 'START' 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.

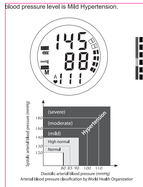
AUTOMATIC INFLATION
There are 4 given levels of given inflation pressure for this device 190mmHg, 230mmHg, 270mmHg and 300mmHg.When 190mmHg is not enough or movement of arm occurs, the device will automatically inflate to reasonable pressure level to ensure a successful measurement, it is not a fault.

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 START button. The device will quickly release the air in cuff and the device will be switched off.

WHO BLOOD PRESSURE CLASSIFICATION INDICATION

Standards for assessment of high or low blood pressure, regardless of age, have been established by the World Health Organization (WHO) as shown in the chart on the adjacent page:
The indicator displays a segment, based on the currant data, corresponding to the WHO classification.
For example: if your blood pressure is 145mmHg (Systolic Pressure), 88mmHg (Diastolic Pressure), according to the World Health Organisation standard, your blood pressure level is Mild Hypertension.

blood pressure level is Mild Hypertension.



Note: If the systolic blood pressure and diastolic blood pressure fall into different categories, the higher value should be taken for classification

FUNCTION OF MEMORY

MEMORY RECALL
1.LD-528 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 R button to recall memory. Press R button, the display will show the average value of the latest 3 readings;
3.Press again, the display will show '01', which means the latest reading, then turns to another screen to show readings;
4.Press again, the display will show '02', which means the second to the latest reading...

MEMORY CLEARANCE
After a measurement is finished or when the device stands by, hold down R button for at least 5 seconds, the display will show 'CLR' which means all the stored reading are removed.

ERROR INFORMATION

INDICATION	POSSIBLE REASON	CORRECTION METHODS
Err	The cuff is put on incorrectly 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 following completely the recommendations of manual
	The cuff is not inflated to necessary pressure.	Repeat the measurement with pumping cuff to higher pressure.

CARE, STORING, REPAIR AND RECYCLING

1. It is necessary to protect this device from 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 away from the children.
3. Keep the cuff away from sharp objects and don't extend of twist the cuff.
4. Use only soft and dry cloth to clean the device.
5. The cuff is sensitive and must be handled with care. You can clean the cuff cover with a damp cloth as daily maintenance.
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 a delicate electrical instrument with an intricate air unit that could be damaged. If you can not fix the problem using the troubleshooting instructions request service from your dealer.
8. It is generally recommended to have the monitor inspected every 2 years, to ensure proper functioning and accuracy and safety. Please contact your dealer for maintenance.

WARNING: Do not modify the equipment without authorisation of the manufacturer.

TROUBLESHOOTING

SYMPTOM	CHECK POINT	REMEDY
No display when the START button is pressed.	The battery has run down	Charge the battery with the adapter or install the battery with new one.
	The polarity of battery is wrong	Install the battery correctly.
	The contact of battery compartment is polluted	Clean the battery terminals with dry cloth.
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 friend) during measurement?	Keep quiet and silent during the measurement
The battery runs out quickly	Faulty battery are used	Use only rechargeable battery recommended in the manual
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 digital blood pressure monitor is 24 months from the date of purchase. The 24 months warranty excludes the monitor cuff. The cuff is warranted for 12 months.
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-528
Size	174 (L)x70.5 (W) ×40 (H)mm
Weight	Approximately 210g without battery
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 by electronic valve
Memory	90 sets of memories
Operation temperature and humidity	+10℃ to + 40℃, 85% and below
Storage temperature and humidity	-20℃ to + 50℃, 85% and below
Cuff size	Applicable for arm size 22 -32 cm
Complete kit	Main body, storage bag, cuff, rechargeable battery, adapter, instruction manual, warranty card

BLOOD PRESSURE RECORD

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

BLOOD PRESSURE RECORD

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

Guidance and manufacturer's declaration-electromagnetic immunity

Guidance and manufacturer's declaration- electromagnetic immunity

The model LD-528 Digital sphygmomanometer is intended for use in the electronic environment specified below. The customer or the user of the model LD-528 Digital sphygmomanometer should ensure that it is used in such an environment.

Emission test	Compliance level	Electromagnetic environment-guidance
RF emissions CISPR 11	Group 1	The model LD-528 Digital sphygmomanometer uses RF energy only for its internal function.Therefore, its RFemissione are very low and aren't likely to cause any interference in nearby electronic equipment.
RE emission CISPR 11	Class B	The model LD-528 Digital sphygmomanometer is suitable for use in all establishments, including domestic establishments, and those directly connected to the public low voltage power supply network that supplies building used for domestic purposes.
Harmonic emission IEC 61000-3-2	Class A	
Voltage fluctuations/ flicker emissions IEC61000-3-3	Complies	

Guidance and manufacturer's declaration- electromagnetic immunity

The LD-528 Digital sphygmomanometer is intended for use in the electromagnetic environment specified below.The customer or the user of the LD-528 Digital sphygmomanometer should ensure that it is used in such an environment.

Immunity test	IEC 60601 test level	Compliance level	Electeomagnetic environme-nt-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 synthe-tic material,the relative humi-dity should be at least 30%.

Guidance and manufacturer's declaration-electromagnetic immunity

Guidance and manufacturer's declaration- electromagnetic immunity

Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environme-nt-guidance
Electrical fast transient/burst IEC 61000-4-4	±2kV for power supply lines ±1kV for input/output supply lines	±2kV for power supply lines ±1kV for input/output supply lines	Main power quality should be that of a typical commercial or hospital environment
Surge IEC 61000-4-5	±1kV differential mode ±2kV common mode	±1kV differential mode ±2kV common mode	Main power quality should be that of a typical commercial or hospital environment
Voltage dips, short interrupti-ons and voltage variations on power supply input lines IEC 61000-4-11	<5% U_T (>95% dip in U_T) for 0.5 cycle (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 (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	Main power quality should be that of a typical commercial or hospital environment. If the user of the LD-528 Digital Sphygmomanometer Equipment requires continued operation during power mains interruptions,it is recommend that the LD-528 Digital Sphygmomanometer Equipment be powered from an uninterruptible power supply or a battery.
Power frequency (50Hz) magnetic field IEC 61000-4-8	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

Guidance and manufacturer's declaration- electromagnetic immunity

The LD-528 Digital Sphygmomanometer is intended for use in the electromagnetic environment specified below.The customer or the user of the LD-528 Digital Sphygmomanometer should ensure that it is used in such an environment.

Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environme-nt-guidance
Conducted RF IEC 61000-4-6	3Vrms 150kHz to 80 MHz	3Vrms	Portable and mobile RF communications equipment should be used no closer to any part of the LD-528 Digital Sphygmomanometer , including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance
Radicted RF IEC61000-4-3	3V/m 80MHz to 2.5 GHz	3V/m	$d=[\frac{3.5}{V_1}]\sqrt{P}$ $d=[\frac{3.5}{E_1}]\sqrt{P}$ 80MHz to 800MHz $d=[\frac{7}{E_1}]\sqrt{P}$ 800MHz TO 2.5GHz Where P is the maximum output power rating of the transmitter in watts(W) according to the transmitter manufacturer and d is the racommended separation distance in metres(m).[1] Field strengths from fixed RF transmitters,as determined by an electromagnetic site survey,

Guidance and manufacturer's declaration-electromagnetic immunity

Guidance and manufacturer's declaration- electromagnetic immunity

Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environme-nt-guidance
			Should be less than the compliance level in each frequency ranged Interference may occur in the vicinity of equipment marked with the following symbol. (((•)))
			Rated maximum output power of transmitter (W) / Separation distance according to frequency of transmitter(m)
			150kHz to 80MHz: $d=[\frac{3.5}{V_1}]\sqrt{P}$
			80MHz to 800MHz: $d=[\frac{3.5}{E_1}]\sqrt{P}$
			800MHz to 2.5GHz: $d=[\frac{7}{E_1}]\sqrt{P}$
			0.01 / 0.1167 / 0.1167 / 0.2334
			0.1 / 0.3689 / 0.3689 / 0.738
			1 / 1.1667 / 1.1667 / 2.333
			10 / 3.6893 / 3.6893 / 7.379
			100 / 11.6667 / 11.6667 / 23.333

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 strengths from fixed transmitters, such as base stations for radio (cell/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 LD-528 Digital Sphygmomanometer is used exceeds the applicable RF compliance level above,the LD-528 Digital Sphygmomanometer should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary,such as reorienting or relocating the LD-528 Digital Sphygmomanometer.
Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.

Guidance and manufacturer's declaration-electromagnetic immunity

Recommended separation distances between portable and mobile RF communications equipment and EQUIPMENT or SYSTEMS that are not LIFE-SUPPORTING

The LD-528 Digital Sphygmomanometer is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled.The customer or the user of theLD-528 Digital Sphygmomanometer can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the LD-528 Digital Sphygmomanometer 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)		
	150kHz to 80MHz $d=[\frac{3.5}{V_1}]\sqrt{P}$	80MHz to 800MHz $d=[\frac{3.5}{E_1}]\sqrt{P}$	800MHz to 2.5GHz $d=[\frac{7}{E_1}]\sqrt{P}$
0.01	0.1167	0.1167	0.2334
0.1	0.3689	0.3689	0.738
1	1.1667	1.1667	2.333
10	3.6893	3.6893	7.379
100	11.6667	11.6667	23.333

For transmitters rated at a maximum output power not listed above, the recommended separation distance 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.

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.

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