PROFESSIONAL MEDICAL PRODUCTS

SFIGMOMANOMETRO ELETTRONICO VETERINARIO
VET ELECTRONIC SPHYGMOMANOMETER
TENSIOMÈTRE VÉTÉRINAIRE ÉLECTRONIQUE
ESFIGMOMANÓMETRO VETERINARIA ELECTRÓNICO
ESFIGMOMANÔMETRO VETERINÁRIO ELETRÔNICO

REF **CONTEC08A-VET (GIMA 80550)**

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M80550-M-Rev.2.10.23

FOREWORD

Please read the User Manual carefully before using this product. The User Manual which describes the operating procedures should be followed strictly. This manual detailed introduce the steps must be noted when using the product, operation which may result in abnormal, the risk may cause personal injury and product damage and other contents, refer to the chapters for details. Any anomalies or personal injury and device damage arising from use, maintain, store do not follow requirements of the User Manual, Our company is not responsible for the safety, reliability and performance guarantees! The manufacturer's warranty service does not cover such faults!

Our company has a factory record and user profile for each device, users enjoy free maintenance services for one year from the date of purchase. In order to facilitate us to provide you with a comprehensive and efficient maintenance service, please be sure to return the warranty card when you need repair service.

⚠**Note: Please read the User Manual carefully before using this product.**

Described in this User Manual is in accordance with practical situation of the product. In case of modifications and software upgrades, the information contained in this document is subject to change without notice.

The warning items

Before using this product, you should consider the safety and efficacy of the following described:

- Described each measurement results combined with clinical symptoms by qualified doctors.
- The reliability and operation of using this product whether meets the operation of this manual relate to the maintenance instructions.
- Do not perform maintenance and service while the device is in use.

⚠**Warning: Replace accessories which not provided by our company may lead to the occurrence of errors. Replace adapters, cuffs or SpO_2 probes at will may result in wrong measurement results. Without our company or other approved maintenance organizations trained service personnel should not try to maintain the product.**

RESPONSIBILITY OF OPERATOR

- The operator must carefully read the User Manual before use this product, and strictly follow the operating procedure of the User Manual.
- Fully consider the security requirements during product design, but the operator should not ignore the observation for the patient and the state of machine.
- The operator has the responsibility to provide the use condition of the product to our company.

RESPONSIBILITY FOR OUR COMPANY

- Our company have the responsibility to provide qualified product which conform to company standard of this product.
- Our company will provide the circuit diagram, calibration method and other information at the request of the user to help the appropriate and qualified technicians to repair those parts designated by our company.
- Our company have the responsibility to complete product maintenance according to the contract.
- Our company have the responsibility to respond the requirements of user in time.
- In the following case, our company is responsible for the impact on the safety, reliability and performance of the device:
- Assembly, addition, debugging, modification or repair are carried out by personnel approved by our company.
- The electrical facilities in the room are in compliance with the relevant requirements and the device is used in accordance with the User Manual.

CHAPTER 1 SAFETY PRECAUTIONS

- In order to use it correctly, please read the "Safety Precautions" carefully before using it.
- Operators do not need professional training, but should use this product after fully understanding the requirements in this manual.
- To prevent users from suffering damage or loss due to improper use, please refer to "Safety Precautions" and use this product properly.

⚠ **Note** ⚠

If not use correctly, it exists the possibility of damage for personnel

and goods.
Good damage means the damage of house, property, domestic animal and pet.
⚠ **Contraindication** ⚠
No.
⚠ **Warning** ⚠
Self-diagnosis and treatment using measured results may be dangerous. Follow the instructions of your physician.
Please hand measurement results to the doctor who knows animal health and accept diagnosis.
Please do not use for any other purpose except BP measurement.
Otherwise it may cause accident or holdback
Please do not keep the cuff in the over-inflated state for a long time.
Otherwise it may cause risk.
Do not use the device in the case of there are flammable anesthetic gases mixing with the air or nitrous oxide.
Otherwise it may cause risk.
If liquid splashes on the device or accessories, especially when liquids may enter the pipe or device, stop using and contact the service department.
Otherwise it may cause risk.
Dispose of the packaging material, observing the applicable waste control regulations and keeping it out of children's reach.
Otherwise it may cause harm to the environment or children.
Please use approved accessories for the device and check that the device and accessories are working properly and safely before use.
Otherwise the measurement result may be inaccurate or an accident may occur.
When the device is accidentally damp, it should be placed in a dry and ventilated place for a period of time to dissipate moisture.
Otherwise the device may be damaged due to moisture.
Do not store and transport the device outside the specified environment.
Otherwise it may cause measurement error.
It is recommended that you check if there is any damage on the device or the accessories regularly, if you find any damage, stop using it, and contact the biomedical engineer of the hospital or our Customer Service immediately. Do not disassemble, repair and modify the device without permission.
Otherwise it cannot be accurately measured.
This device can not be used on mobile transport platforms.
Otherwise it may cause measurement error.
This device can not be used on a tilted tabletop.
Otherwise there is a risk of falling.
Dispose of packaging materials, waste batteries and end-of-life products in accordance with local laws and regulations. The end-of-life products and materials are properly disposed of by the user in accordance with the authority's decree.
Replace accessories which not provided by our company may lead to the occurrence of errors.
Without our company or other approved maintenance organizations trained service personnel should not try to maintain the product.
This device can only be used for one test object at a time.
If the small parts on the device are inhaled or swallowed, please consult a doctor promptly.
The device and accessories are processed with allergenic materials. If you are allergic to it , stop using this product.
After pressing the power button, if the device has display fault such as white screen, blurred screen or no display content, please contact our company.
The device shall comply with the standard IEC 80601-2-30:Particular requirements for basic safety and essential performance of automated non-invasive sphygmomanometers.

1.1 Operation for AC Adapter (Separate Sale)

⚠ **Note** ⚠
The device can be powered by a power adapter that is a part of the medical electrical system.
Be sure to use the dedicated medical grade power adapter of this device.
Otherwise it may cause trouble
Dedicated power adapter must use AC 100 V~240 V
Otherwise it may cause fire or electric shock.

When there is breakage of dedicated power adapter plug or wire, please do not use it.
Otherwise it may cause fire or electric shock.
Please do not plug or unplug the adapter on the socket with wet hands.
Otherwise it may cause electric shock or injury.

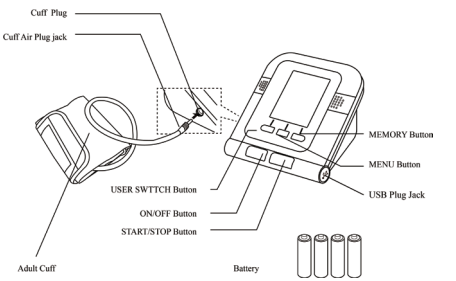
1.2 Operation for Battery

⚠ **Note** ⚠
Please use 4 "AA" size manganese or alkaline batteries, do not use batteries of other types.
Otherwise it may cause fire.
New and old batteries, different kinds batteries can not be put off.
Otherwise it may cause battery leakage, heat, rupture, and damage to Electronic Sphygmomanometer.
Please don't put wrong the positive and negative of battery. When the batteries power exhausts, replace with four new batteries at the same time.
Please take out the batteries when you do not use the device for a long time(3 months or more).
Otherwise it may cause battery leakage, heat, rupture, and damage to Electronic Sphygmomanometer.
If electrolyte of the batteries immodestly get in your eyes, immediately rinse with plenty of clean water.
It will cause blindness or other hazards, should immediately go to the nearest hospital for treatment.
If electrolyte of the batteries immodestly glues on the skin or the clothes, immediately rinse with plenty of clean water.
Otherwise it may hurt the skin.
Advice
Do not strike or drop the device;
Do not inflate before the cuff wraps around the limbs;
Do not inflect the cuff and the air tube forcibly.
Description of functions:
The Sphygmomanometer apply to measure the non-invasive blood pressure and SpO_2 of animal, user can store 100 items records of measurement results at most. Each record includes detailed measuring time, systolic pressure, diastolic pressure, average pressure, pulse rate and record number, etc. With 2.8 inch color LCD screen, clear interface, the function of data review is complete. User can implement ON/OFF, manual measuring, system setup, parameters change and other operations with five buttons which are located on the front panel of the device.
With timing shutdown function, if there is no operation and SpO_2 measurement, the device will automatically turn off after 2 minutes. With USB interface, Users can send measurement results to PC. Refer to the help or explication of the related software for specific operation.
Purpose:
The device apply to measure the non-invasive blood pressure and SpO2(optional) of animal. Record parameter value of blood pressure to provide the reference for the health care professional.
⚠ **Warning** ⚠
You must not perform NIBP measurements on animals with sickle-cell disease or under any condition which the skin is damaged or expected to be damaged.
For a thrombasthemia animal, it is important to determine whether measurement of the blood pressure shall be done automatically. The determination should be based on the clinical evaluation.
Ensure that the correct setting and blood pressure cuff are selected when performing measurements on animal. It may be dangerous for the animal to use an over pressure level.
The device has normal useful life for five years since the first electrified use. After its normal life, dispose the device and its accessories according to applicable local regulations about environmental.

CHAPTER 2 MAIN UNIT

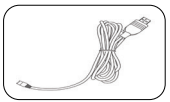
The production is in the package. Open the package and confirm whether

the production is whole.



Accessories:

The sphygmomanometer supports cuffs in a variety of sizes, please choose suited cuff according to the size of the animal.



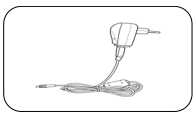
USB Data Line

User Manual

Optional Accessories:

AC adapter AC adapter cable

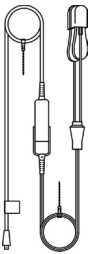
Input: voltage: AC 100 V~240 V
frequency: 50 Hz/60 HZ
Rated current: AC 150 mA
Output: DC 6.0 V±0.2 V 1.0 A
or DC5.0 V±0.2 V 1.0 A



SpO_2 probe: Integrated SpO_2 probe (Optional)

A. SpO_2 measurement
Range:0 %~100 %
Error: 70~100 %:±2 %; Below 70 %:unspecified
Resolution: 1 %

Note: because SpO_2 probe measurements are statistically distributed, only about two-thirds of SpO_2 probe measurements can be expected to fall within ±Arms of the value measured by a CO-OXIMETER.



B. Pulse rate measurement
Range:30 bpm~250 bpm
Error: ±2 bpm or ±2 % (select the larger)
Resolution: 1bpm

C. Optical sensor: red light(wavelength: 660 nm, output power less than 6.65 mW) infrared light(wavelength: 880 nm, output power less than 6.75 mW). Optical sensors are light-emitting components that affect other medical devices that use this wavelength range. This information may be useful to clinicians who perform optical therapy.

D. Error in weak filling condition: SpO_2 and pulse rate can be shown correctly when pulse-filling ratio is 0.4 %. SpO_2 error is ±4 %; when measuring range is 30 bpm~100 bpm, pulse rate error is ±2 bpm; when measuring range is 100 bpm~250 bpm, pulse rate error is ±2 %.

Note:

◎The optional probe of the Sphygmomanometer is an integrated SpO_2 probe, the measuring part is integrated with the probe;

Cuff:

There are several suitable cuffs(range of limb circumference,middle of upper limb)

the range of limb circumference is 6-11 cm
the range of limb circumference is 10-19 cm
the range of limb circumference is 18-26 cm

⚠ **Note** ⚠

©The cuff is a consumable. Calculate by measuring 6 times a day(3 times each morning and evening), the service life of the cuff is about 2 year. (using our experimental conditions)
©In order to correctly measure blood pressure, please replace the cuff in time.
©If the cuff leaks, please contact our company to buy a new one. The cuff purchased separately does not include the airway tube plug. When replacing, please do not throw the airway tube plug away, install it on the new cuff.

⚠ Note ⚠

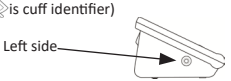
When the product and accessories described in this manual are about to exceed the period of use, they must be disposed according to relevant product handling specification. If you want to know more information, please contact our company or representative organization.
*The device will automatically turn off after two minutes in which there is no operation to the device, even if you forget to turn the power off.

CHAPTER 3 EXTERNAL INTERFACES

⚠ Note ⚠

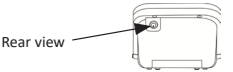
When removing NIBP cuff, please take plug at the front of the windpipe to pull out.

1 @Cuff socket( is cuff identifier)



2 @The right side of the device has a USB port. USB socket( is USB identifier)

3 @The rear side of the device has a power adapter socket. Power adapter socket(is power socket identifier)

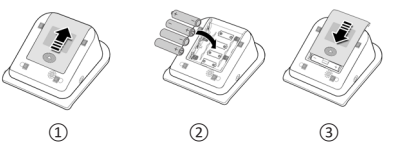


⚠ Note ⚠

All analog and digital equipment connected to this device must be certified to IEC standards(such as IEC60950: Information technology equipment-Safety and IEC60601-1: Medical electrical equipment-Safety), and all equipment should be connected to in accordance with the requirement of the valid version of the IEC60601-1-1 system standard. The person connecting the additional equipment to the signal input and output port is responsible for whether the system complies with the IEC60601-1 standard.

CHAPTER 4 BATTERY/AC ADAPTER INSTALLATION

The product can use battery or AC adapter as power source.



4.1 Battery Installation

1 @Demount the battery cover in the direction of the arrow.
2 @Install "AA" batteries according to ⊕⊖ polarities.
3 @Slide to close the battery cover.
Icon "▭": the batteries power will exhaust. Replace with four new batteries (the same sort) at the same time. Test while low power may cause data deviation and other problems.
Turn the unit off before replacing the batteries.

⚠ Note ⚠

When the battery reaches the end of its life, or if the battery is found to have odor, deformation, discoloration or distortion, stop using the battery and dispose of the used battery in accordance with local regula-

tions, otherwise it will cause environmental pollution.

4.2 Usage of power adapter

1.Connect the sphygmomanometer and the power adapter. Insert the power adapter plug into the power adapter socket on the right side of the device.

2.Please insert the power plug of the adapter into the AC 100 V~240 V socket.

⚠ **Note** ⚠

The device can be disconnected from the power supply network by unplugging the adapter plug.

When cut off the power supply, first cut off the connection of power socket and the regulated power supply, then cut off the connection of regulated power supply and the sphygmomanometer.

Please be sure to use dedicated medical grade power adapter.

⚠ **Note** ⚠

When regulated power supply and batteries are both used at the same time, the battery power will not be consumed.

Switch regulated power supply and battery as power supply when the device is off, otherwise, the device may shutdown due to power failure.

The device can be used normally after it is turned on ,without waiting for the device to be prepared.

CHAPTER 5 BUTTON FUNCTIONS

All the operations to the Electronic Sphygmomanometer are through the buttons. The names of the buttons are above them. They are:

【ON/OFF】 ON/OFF button. Press this button to turn on/off the device.

【START/STOP】 Press it to inflate the cuff and start a blood pressure measurement. During measuring, press it to cancel the measurement and deflate the cuff.

At all levels interface, the three buttons correspond respectively with the text prompts below the LCD screen, pressing any button will carry on the corresponding function, such as【UP】【MENU】【ENTER】【DOWN】etc.

CHAPTER 6 SETTING THE DATE AND TIME

It is necessary to set date and time after power on.

The Electronic Sphygmomanometer can automatically stores measurement results with date and time.

If batteries power exhausts or removed, the time to stop.

At the moment, please reset date and time.

The Electronic Sphygmomanometer stores measure results of three users automatically, and up to 100 items for every user. If the date and time are set correctly, the date and time when measuring will be correct in the memory, otherwise it may not be correct.The results can be uploaded to PC via USB and processed with the PC software.

1、There are two modes of time setting:

(1) When using the Sphygmomanometer for the first time or after the Sphygmomanometer has been placed without power supply for a certain time(more than 3 minutes), after power on, there is a prompt of time error on the main interface, set date and time with【UP】,【DOWN】and【ENTER】button.

(2) Press【MENU】button on the main interface to enter system menu, then enter【SYSTEM TIME】item, the current time will be displayed on the screen. Set date and time with【UP】,【DOWN】and【ENTER】button.

2 AAfter setting, select【CONFIRM】option and press【ENTER】button to confirm the setting value. If you do not want to change the time, select【EXIT】option and press【ENTER】button to return to the previous menu.

⚠ **Note** ⚠

The range of year is from 2010 to 2099. When the year reaches 2099, pressing the【UP】button will return to 2010.

CHAPTER 7 ABOUT UNIT

There are two units: "mmHg" and "kPa".

The default is: "mmHg".

Enter the【SYSTEM SETUP】submenu in【SYSTEM MENU】, then select【UNIT】option to switch units between "mmHg" and "kPa".

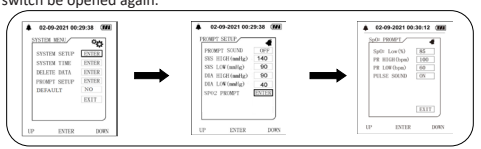
CHAPTER 8 OVER-LIMIT PROMPT FUNCTION

The Sphygmomanometer has two kinds of reminding methods:the technical parameter over-limit prompt and the physiological parameter over-limit prompt.

8.1 Physiological parameter over-limit prompt

The sphygmomanometer has the function of over-limit prompt, the user can press【MENU】button to enter system menu, select【PROMPT SETUP】option to enter its interface, then set the limit value of blood pressure. When the BP measurement result is higher than the high limit or lower than the low limit and the prompt is ON, the physiological prompt will occur; in【PROMPT SETUP】interface, select【SpO_2 PROMPT】option to enter its interface, when the SpO_2 measurement result is higher than the high limit or lower than the low limit and the prompt is ON, the physiological prompt will occur.

In the state of physiological prompt, press any button to cancel the prompt and it does not affect the next prompt; the prompt can be closed permanently with prompt switch of the prompt setup menu until the prompt switch be opened again.



8.2 Technical parameter over-limit prompt

When power is about to exhaust and prompt is ON, the prompt will occur. This prompt can not be canceled unless being closed or the power replaced.

CHAPTER 9 THE USAGE METHOD OF SPHYGMOMANOMETER

9.1 Accurate Measurement Way

It is recommended that you bind the cuff to the forelimbs when the pet patient is lying to the right or left.This treatment can help to make sure that the cuff is at the same level as the animal's heart,which is most benefical for obtaining accurate blood pressure values, in addition,in the process of measuring blood pressure,when the cuff squeezes the forelimb,the animal is less likely to retract the forelimb.

The limb chosen for taking the measurement should be placed at the same level as the animal's heart. If this is not possible you should apply the following corrections to the measured values:If the cuff is placed higher than the heart level, add 0.75 mmHg for each inch of difference.If it is placed lower than the heart level, deduct 0.75 mmHg for each inch of difference.

⚠ **Advice** ⚠

Try to measure your animal's blood pressure at the same time each day with the same limbs and the same pose for consistency.

Do not touch Electronic Sphygmomanometer, cuff and windpipe during measurement.

Measurements should be taken in a quiet place and the body relax.

Remain still 4~5 minutes before measurement.

Do not bark or move during the measurement,Relax the body, do not let the muscle activity.

Wait 4~5 minutes between measurements.

Do not use precision instruments near the Sphygmomanometer.

Please use the sphygmomanometer at an environment of suitable temperature and humidity(refer to Chapter 18, otherwise it will cause measurement error.

⚠ **Warning** ⚠

When repeatedly measuring, the accurate blood pressure value may not be measured due to congestion in the limbs. Please measure after the

blood flow is smooth.
Repeated measurement for a long period of time, limbs rubbing with the cuff may be accompanied by purpura, ischemia and nerve damage. When measurement a animal, it is necessary to frequently check the color, warmth and sensitivity of the distal of the limb.
Once any abnormalities are observed, place the cuff in another position or stop the blood pressure measurement immediately.
Do not twist or wrap the airway tube. It can cause constant pressure in the cuff which can block blood flow and cause serious damage to the animal.
Do not use the cuff in the area where the treatment is being performed inside blood vessel or the arteriovenous connection. This may case temporary blockage of blood flow and cause injury to the patient. Do not use the cuff on the side of the mastectomy. When using the cuff to pressurize, some of the body's functions may temporarily weaken. Do not use the measurement medical electrical equipment at the appropriate limbs position. The device need to be placed for 2 hours from the minimum storage temperature to being ready for its intended use.
The device need to be placed for 4 hours from the highest storage temperature to being ready for its intended use.

⚠ Note ⚠

The following conditions may also cause changes in the blood pressure measurement value.

When measuring, the patient is nervous, excited, emotional instability;
The room temperature rise or fall sharply, or the environment of measurement often changes;
Measuring in a moving vehicle;
The high and low location of cuff will cause changes in measurement results;
Continuous measurement for a long time.

9.2 Applying the Cuff

The measurement can be carried out by applying the cuff on left or right forelimb.
Carry out the operation in a room with comfortable temperature.
Wear the cuff accurately following these steps:
① Make sure the air plug is securely inserted in the main unit.

② Apply the blood pressure cuff to the animal's leg following the instructions below .

- Ensure that the cuff is completely deflated.
- Apply the appropriate size cuff to the animal. Ensure that the cuff is not wrapped too tightly around the limb. Excessive tightness may cause discoloration and eventual ischemia of the extremities.
- Make sure that the cuff edge falls within the range of mark.If it does not, use a larger or smaller cuff that fits better.

⚠ **Note** ⚠

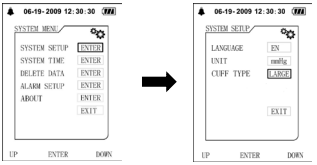
Every CUFF TYPE corresponds to different cuff sizes, which are identified on the cuff. As follows:

Cuff Type	Limb perimeter
Small	<13
Middle	8 ~ 26 cm
Big	>25 cm

9.3 BP Measurement

In order to measure accurately, pay attention to applying the cuff properly. Select a proper cuff according to different animals, then select proper cuff type(large, middle and small).

There are two ways to select the cuff mode, in the time interface, press CUFF button to switch cuff mode; or enter the【SYSTEM SETUP】submenu in【SYSTEM MENU】, and complete switching in 【CUFF TYPE】item.



⚠ **Note** ⚠

When the animals is a newborn, please select thesmall cuff mode and select the appropriate size of the cuff to measure, otherwise it may cause harm to the animals.

①Press 【**START/STOP**】 button to start measurement.

During measurement, please keep correct pose and quiet state, do not move.

If you want to abort the measurement,Press【START/STOP】button, the device will stop inflating, and release the air from the cuff.

②Confirm the Measurement Value

The measurement value can be stored automatically, using [memory function] (refer to Chapter11).

*Self-diagnosis and treatment using measured results may be dangerous. Follow the instructions of your physician.

⚠ Note ⚠

Wait at least 4-5 minutes between measurements

When repeatedly measuring, the accurate blood pressure value may not be measured due to congestion in the limbs. Please measure after the blood flow is smooth.

- When some factors affect the measurement results in measurement process, error messages will appear on the screen, you can obviate the malfunction and restart a measurement.
- The minimum value of the patient's physiological signal is the minimum limit that the device can measure. The device may obtain inaccurate measurement results when it is operated below the minimum amplitude or minimum value of the patient's physiological signal.

③In the state of the physiological parameter over-limit prompt is not triggered, press any button to carry on the corresponding button function; in audio prompt state, press any button (except【ON/OFF】button) to clear up the audio prompt.

④Take off the cuff, press【ON/OFF】button to turn the device off.

CHAPTER 10 MEMORY FUNCTION

The sphygmomanometer is designed to store the blood pressure, pulse rate values and the date and time when measured, which are up to 100 groups. If there have been stored 100 groups, the earliest results will be deleted when saving the 101 group of measurement results.

10.1 Review Memory Values

1. In the main interface (interface when starting-up), press【MEMORY】button to review the latest measured values in big-font with the serial number from 1 to 100.
2. Press【UP】/【DOWN】button to circularly switch the former measurement values.

*The right figure shows that there is no measurement result can be displayed.

3. Press【LIST】button to display the data list interface.
4. Press【TREND】 button to display trend interface.

End to display the measurement values:

Press【EXIT】button to return to the main interface or hold【ON/OFF】button to turn the device off.

10.2 Delete Memory Values

Users can delete all memory values of a user instead of separately delete one memory value.

1. Press【MENU】button to enter the system menu, select【DELETE

DATA】option to enter its interface, select the user whose data to be deleted, after confirming again, all measurement results of the selected user will be deleted.

2. Finish Operation

Select【CONFIRM】or【EXIT】to return to the previous menu, or hold【ON/OFF】button to turn the device off.

CHAPTER 11 SPO2 MEASUREMENT FUNCTION(OPTIONAL)

Precautions during SpO_2 Measurement:

⚠ Note ⚠

◎Make sure the nail covers the light. The probe cable should be on the backside of the hand. Improper probe placement or improper contact with the test site will influence the measurement.

◎SpO_2 value always displays in the fixed place.

◎Data averaging and signal processing will delay the SpO_2 displaying and data values transmitting. The update time of measurement data is less than 30 seconds, when signal attenuation, weak perfusion or other interference appears, it will result in time increasing of dynamic data averaging, which depends on the PR value.

◎The PLETH waveforms are not normalized, which is used as the indicator for signal incompleteness. So the accuracy of the measured values may decrease when the waveform does not tend to smooth and stable. When the waveform tends to smooth and stable, the reading is optimal value, and the waveform at the moment is the most standard one..

◎The temperature for the contact surface of the device with the body is less than 41℃, and this temperature value is measured by a temperature measuring device.

◎The device does not provide over-limit prompt function, so it is inapplicable for using in places where need such function.

◎The SpO_2 probe has been calibrated before leaving factory. It does not need to be calibrated during maintenance.

◎SpO_2 probe is calibrated to show functional oxygen saturation.

◎The SpO_2 probe and photoelectric receiving tube should be arranged in a way with the subject's arteriole in a position there between. Make sure the optical path is free from any optical obstacles like rubberized fabric, to avoid inaccurate measurement.

◎As the measure is taken on the basis of arteriole pulse, substantial pulsating blood flow of subject is required. For a subject with weak pulse due to shock, low ambient/body temperature, major bleeding, or use of vascular contracting drug, the SpO_2 waveform (PLETH) will decrease. In this case, the measurement will be more sensitive to interference.

◎The accuracy of the readings under weak perfusion has been verified using signals from the patient simulator. The SpO_2 and pulse rate values vary within the measurement range due to various weak signal conditions and are compared to the actual SpO_2 and pulse rate values of the known input signals.

◎The claim for SpO_2 accuracy should be supported by clinical research measurements covering the entire spectrum. By artificially inducing to different stable oxygen levels, make it in the range of 70 % ～ 100 % of SpO_2. Use secondary standard SpO_2 measuring equipment for comparison to collect SpO_2 values together with the tested product, compose paired data groups for accuracy analysis.

◎When using the device, please keep it away from the instruments that can generate strong electric or magnetic field. Use the device in an inappropriate environment may cause interference to the surrounding radio equipment or affect its working.

◎If necessary, please log on our company's official website to download the list of SpO_2 probes and extension cords that can be used in conjunction with this device.

⚠ Warning ⚠

◎Check if the cable of SpO_2 probe is in normal condition before measuring. After unplugging the SpO_2 probe cable from the socket, "SpO_2%" and "bmp" on the screen will disappear.

◎Do not use the SpO_2 probe once the package or the probe is found damaged. Instead, you shall return it to the vendor.

◎The supplied SpO_2 probe is only suitable for use with this device. This device can only use the SpO_2 probe described in this manual. It is the responsibility of the operator to check the compatibility of the device and the SpO_2 probe (and extension cable) before use. Incompatible accessories may result in device performance decreasing or cause injury to the patient.

◎SpO_2 probe is a medical product that can be used repeatedly.

©The measured value may be normal seemingly for the testee who has anemia or dysfunctional hemoglobin (such as carboxyhaemoglobin (COHb), methaemoglobin (MetHb) and sulfhaemoglobin (SuHb)), but the testee may appear hypoxia, it is recommended to perform further assessment according the clinical situations and symptoms.
©Pulse oxygen has only reference significance for anemia and toxic hypoxia, as some patients with severe anemia still show better pulse oxygen measurements.
©Measurement accuracy can be affected by the interference of electrosurgical equipment.
©Do not install the SpO_2 probe on an extremity with arterial catheter or receiving intravenous injection.
©Do not perform SpO_2 measuring and NIBP measuring on same limb at one time, because obstruction of blood flow during NIBP measuring may adversely affect the reading of SpO_2 value.
©Excessive movement (active or passive) of the subject or severe activity can affect the measurement accuracy.
©Excessive ambient light may affect the measuring results, such as surgical light (especially xenon light sources), bilirubin lamp, fluorescent lamp, infrared heater and direct sunlight, etc. In order to prevent interference from ambient light, make sure to place the probe properly and cover the probe with opaque material.
©The measured value may be inaccurate during defibrillation and in a short period after defibrillation, as the SpO_2 probe not have defibrillation-proof function.
©The person who is allergic to silicone, PVC, TPU, TPE or ABS can not use this device.
©For some special patients, it should be a more prudent inspecting in the measurement part. The probe can not be clipped on the edema and tender tissue.
©Do not stare at the luminescent component directly when the device is turned on (infrared light is invisible), even if for maintenance purpose, or it may have bad influence to the eyes.
©Some models of functional tester or patient simulator can measure the accuracy of the device that reproduces the calibration curve, but it can not be used to evaluate the accuracy of this device.
©Please refer to related medical literature for detailed clinical restrictions and contraindications,
©This device is not used for treatment purpose.
©Do not use the SpO_2 probe during MRI and CT scanning, as the induced current may cause burns.
©When the device is ON, if power interrupt for more than 30s, the SpO_2 probe needs no operation after the power is restored, after the device is turned on, ensure that the SpO_2 probe can be used normally.
©The probe can be used before/after sport, but not recommended to use during exercising.

CHAPTER 12 SPO2 MEASUREMENT METHOD

(This chapter is only suitable for European Union market)
Put the animal tongue enough into the animal nip of probe as the following figure.

Place SpO_2 probe

Plug the connector of the SpO2 probe cable into the USB socket in the lower right of the device. The main interface will switch to SpO_2 interface. This operation brings no affection to other functions.
⚠ **Note** ⚠
SpO_2 display range: 0 % ~ 100 %, PR display range: 30 bpm (beats/min) ~ 250 bpm (beats/min)
If the SpO_2 works abnormally, after connecting the SpO_2 probe to the device, the device will not switch to the SpO_2 interface or no data displayed under the SpO_2 interface.
Measurement Limitation
During operation, the accuracy of SpO_2 readings can be affected by:

- High-frequency electromagnetic interference such as interference from electrosurgical apparatus connected to the system.
- Intravenous dyestuff.
- Excessive animal movement.
- External light.
- Improper SpO_2 probe installation or incorrect contact position of the patient.
- Temperature of SpO_2 probe(optimal temperature range: 28°C ～ 40°C).
- Place the SpO_2 probe on an limb that has a blood pressure cuff, arterial catheter, or intravascular line.
- Concentrations of dysfunctional hemoglobin, such as carboxyhemoglobin(COHb) and methemoglobin(MetHb).
- SpO_2 is too low, Bad circular perfusion of the part being measured.
- Intravascular staining agents (such as indocyanine green or methylene blue), skin pigmentation.
- It is required to use SpO_2 probe which is provided by our company, contact with our sale department when necessary.

CHAPTER 13 ERROR MESSAGE

Error message will be displayed in the screen if there is something wrong when measuring. The causes and solutions are shown as follows:

Error Message	Causes	Solutions
Self-test failure System failure	Function abnormal	Please contact us
Loose cuff	Cuff is not connected correctly.	Correctly connect cuff (refer to Chapter 9)
Air leakage	Cuff plug fall off	Make sure the cuff plug is securely inserted in the windpipe (refer to Chapter 9)
Air pressure error	Air pressure error	Refer to the troubleshooting
Weak signal	The pulse signal is too weak or the cuff is loose.	Correctly connect cuff (refer to Chapter 9)
Overpressure	Cuff is blocked or squeezed	Correctly connect cuff (refer to Chapter 9)
Excessive movement Over range Saturated signal	The signal extent is too big owing to the limbs or body moving or other reasons when measuring	Keep limbs, body still, measure again
Time out	It takes too much time	

CHAPTER 14 TROUBLESHOOTING

Abnormal Phenomenons	Causes	Solutions
BP measurement values too high or too low.	Cuff is not connected correctly.	Correctly connect cuff (refer to Chapter 9)
	Move limbs when measuring	Keep quiet and restart a measurement
No pressure	Cuff leakage	Buy a new cuff
	The cuff windpipe is not correctly connected with cuff	Correctly connect
	Cuff is not inflated	Stop using the device and contact us
Cuff deflates in short time	Loose cuff	Correctly apply cuff
It can not carry on measurement when press the measurement button		Switch on the power once again and restart a measurement

Power off suddenly when inflating	No use for a long time, the power of batteries can be exhausted owing to the changed temperature	Replace all four batteries with new ones.
Hold the on/off button but can not start the device	Power of batteries can be exhausted	Replace all four batteries with new ones.
	The battery polarities is reversed	Check the battery installation for proper placement of the battery polarities.
Cuff inflation start before press the measurement button or never stop inflating when measuring		Pull out the cuff to deflate. Stop using the device and contact us.
Cuff never deflation		Pull out the cuff to deflate. Stop using the device and contact us.
Air pressure error	No deflation or deflation error or inflation without stop	Pull out the cuff to deflate. Stop using the device and contact us.
	Others	Keep limbs, body still, measure again.
No press value displayed or the value unchanged or change erratically when cuff inflated		Pull out the cuff to deflate. Stop using the device and contact us.
Other phenomenon		Switch on the power once again and restart an operation. Replace the batteries. If no, please contact us.

CHAPTER 15 KEYS AND SYMBOLS

Symbol	Description
	Instruction manual/booklet.
SYS	Systolic pressure
MAP	Mean pressure
DIA	Diastolic pressure
PR	Pulse rate (bpm)
GRANDE	Large animal
MEDIO	Middle animal
PICCOLO	Small animal
INFO	Information
	Open the over-limit prompt sound indication
	Close the over-limit prompt sound indication
	Low-power
	Full-power
	1.No NIBP data to review 2.No finger inserted to SpO2 probe(Optional) 3.An indicator of signal inadequacy
	Class Ⅱ equipment

	Type BF Applied Part

SN	Serial number
	USB socket connect SpO_2 probe(This item only suitable for European Union market)
	Interface for connecting cuff
	Socket for power adapter
	Manufacturer
	Keep away from sunlight
	Fragile, handle with care
	Atmospheric pressure limitation
	Temperature limit
	WEEE disposal
	Date of manufacture
	Keep in a cool, dry place
	This side up
%	Moisture limitation

	Caution: read instructions (warnings) carefully
CE	Product complies with European Directive
REF	Product code
EC REP	Authorized representative in the European community
LOT	Lot number

CHAPTER 16 MAINTENANCE, CLEANING AND KEEPING

***Please do obey the precautions and correct operating methods in this user manual. Otherwise, we will not responsible for any fault.**

⚠ Warning ⚠

Remove the batteries before cleaning. The accessories and main unit must be separated for cleaning.

Maintenance is not allowed during device using.

Do not squeeze the rubber tube on the cuff.

⚠ Caution ⚠

- High pressure disinfection to the device and accessories is not allowed.
- Do not let water or cleaning agent flow into the socket to avoid device damage.
- Do not soak the device and accessories in liquid.
- If any damage or deterioration of the device and accessories is found, please do not use it.

Maintenance:

- Clean the device and accessories regularly. It is recommended to clean them every one month. When the device or accessory gets dirty, use a dry and soft cloth to wipe.

If they are very dirty, it is available to dip the soft cloth into water or mild detergent, and wring out, then use the cloth for cleaning.

- The device should be inspected and calibrated periodically (or obey the requirements of the hospital). It is available to inspect in the state specified inspection institution or by professional personal, or you can contact our company.Long press "USER" button in main interface for 5s to enter the calibration interface.

Advice

- Do not use gasoline, volatile oil, diluent, etc. to wipe the device.
- Do not clean or wet the cuff.

Storage:

Advice

- Do not expose the device in direct sunlight for long time, otherwise the display screen maybe damaged.
- The basic performance and safety of the device are not affected by the dust or cotton wool in home environment, while the device shall not be placed where with high temperature, humidity or dusty.
- Aged cuff may result in inaccurate measurement, please replace the cuff periodically according to the user manual.

- To avoid device damage, keep the device out the reach of children and pets.
- Avoid the device close to extreme high temperature such as fireplace, otherwise the device performance may be affected.
- Do not store the device with chemical medicine or corrosive gas.
- Do not place the device where there is water.
- Do not place the device where with slope, vibration or impact
- Take the batteries out if the device is not to be used for three months or longer.

CHAPTER 17 NIBP SPECIFICATION

Name	Electronic Sphygmomanometer
Display mode	2.8'' color LCD Display
The degree of protection against ingress of water	IPX0
NIBP specification	
Measurement method	Oscillometric method
Working mode	Automatic
Operation mode	Continuous operation
Measurement Range	Pressure:0～297mmHg（0～39.6kPa）
	Pulse: 40~240bpm
Resolution	Pressure: 1mmHg(0.1 kPa)
Accuracy	Static pressure: ±3 mmHg(±0.4 kPa)
Error	The BP Value of the device is equivalence with the measurement value of Stethoscopy. The error meets the requests in the ANSI/ AAMI SP-10:2002+A1:2003 +A2:2006
Operating temperature/ humidity	+5 ºC~40 ºC 15 %RH~85 %RH(Non-condensing)
Transport	Transport by general vehicle or according to the order contract, avoid pounded, shake and splash by rain and snow in transportation.
Storage	Temperature: -20 ºC~+55 ºC; Relative humidity: ≤95 %; No corrosive gas and drafty.
Atmospheric pressure	700 hPa~1060 hPa

Power supply	4 "AA" alkaline batteries, AC Adapter(AC, 100 V-240 V, optional)
Rated current	≤ 600 mA
Battery life	When the temperature is 23 ºC, limb circumference is 270 mm, the measured blood pressure is normal, 4 "AA" alkaline batteries cab be used about 300 times.
Dimensions	130(L)*110(W)*80(H) mm
Unit Weight	300 gram(without batteries)
Safety classification	Class Ⅱ equipment (power supplied by power adapter)/Internally powered equipment (power supplied by batteries) Type BF applied part
Service life	The service life of the device is five years or 10000 times of BP measurement.
Date of manufacturer	See the label

***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.*

GIMA WARRANTY TERMS

The Gima 12-month standard B2B warranty applies