# GIMA
PROFESSIONAL MEDICAL PRODUCTS

OXY-50 VET PULSE OXIMETER with software

REF CMS60D-VET (GIMA 80800)

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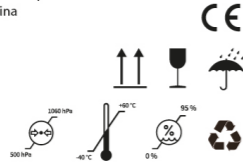
User Notice

Dear users, thank you very much for purchasing the Veterinary Pulse Oximeter (hereinafter referred to as device).

The Manual describes, in accordance with the device's features and requirements, main structure, functions, specifications, correct methods for transportation, installation, usage, operation, repair, maintenance and storage, etc. as well as the safety procedures to protect both the user and device. Refer to the respective chapters for details.

Please read the User Manual carefully before using this device The User Manual which describes the operating procedures should be followed strictly. Failure to follow the User Manual may cause measuring abnormality, device damage and animal injury. The manufacturer is NOT responsible for the safety, reliability and performance issues and any monitoring abnormality, animal injury and device damage due to users' negligence of the operation instructions. The manufacturer's warranty service does not cover such faults.

Owing to the forthcoming renovation, the specific products you received may not be totally in accordance with the description of this User Manual. We would sincerely regret for that.

Our company has the final interpretation to this manual. The content of this manual is subject to change without prior notice.

Warnings

Remind that it may cause serious consequences to test animal, user or environment.

- Explosive hazard—DO NOT use the device in environment with inflammable gas such as anesthetic.
- DO NOT use the device while examining by MRI or CT, as the induced current may cause burn.
- Do not take the information displayed on the device as the sole basis for clinical diagnosis. The device is only used as an auxiliary means in diagnosis. And it must be used in conjunction with doctor's advice, clinical manifestations and symptoms.
- The maintenance to the device can only be performed by qualified service personnel specified by manufacturer, Users are not permitted to maintain or refit the device by themselves. Unauthorized modification of the device would result unacceptable risk.
- Uncomfortable or painful feeling may appear if using the device ceaselessly, especially for the microcirculation barrier animal. It is recommended that the sensor should not be applied to the same part for over 2 hours.
- For the special animal, there should be a more prudent inspecting in the placing process. The device can not be clipped on the edema and tender tissue.
- Please do not stare at the red and infrared light emitter (the infrared light is invisible) after turning on the device, including the maintenance staff, as it may be harmful to the eyes.
- Each part of the device is firmly fixed,if accidental falling leads to the small parts such as a button to fall off,avoid swallowing of these parts,it may cause suffocation.
- The device contains silicone, PVC, TPU, TPE and ABS materials, whose biocompatibility has been tested in accordance with the requirements in ISO 10993-1, and it has passed the recommended biocompatibility test. Animals allergic to silica gel, PVC, TPU, TPE or ABS cannot use this device.
- The disposal of scrap device, its accessories and packaging should follow the local laws and regulations, to avoid polluting to the local environment. And the packaging materials must be placed in the region where the children are out of reaching.
- The device can not be used with the equipment not specified in the Manual. Only the accessories appointed or recommended by the manufacturer can be used, otherwise it may cause injury to the test animal and operator or damage to the device.
- The SpO2 probe accompanied is only suitable for using with the device. The device can only use the SpO2 probe described in the Manual, so the operator has the responsibility to check the compatibility between the device and the SpO2 probe before using, incompatible accessories may cause device performance degradation, device damage or animal injury.
- Do not reprocess the accompanying SpO2 probe.
- Check the device before use to make sure that there is no visible damage that may affect animal's safety and device performance. When there is obvious damage, please replace the damaged parts before use.
- When the message "Sensor Off" or "Sensor Fault" appears on the screen, it indicates that the SpO2 probe is disconnected or line fault occurs. Check the connection of the SpO2 probe and whether there is damage for the probe, if necessary, please replace the probe to avoid risks. The probe fault will not result in a safety hazard.
- Functional testers can not be used to assess the accuracy of the SpO2 probe and Veterinary Pulse Oximeter.
- Some functional testers or patient simulators can be used to verify whether the device works normally, for example, INDEX-2LFE Simulator (software version: 3.00), please refer to the Manual for the detailed operation steps.
- Some functional testers or patient simulators can measure the accuracy of the device copied calibration curve, but they can not be used to evaluate the device accuracy.

- When using the device, please keep it away from the equipment which can generate strong electric field or strong magnetic field. Using the device in an inappropriate environment may cause interference to the surrounding radio equipment or affect its working.
- When storing the device, keep it away from children, pets and insects to avoid affecting its performance.
- Do not place the device in places exposed to direct sunlight, high temperature, humidity, dust, cotton wool or easy to splash water, to avoid affecting its performance.
- The measured accuracy will be affected by the interference of electrosurgical equipment.
- When several products are used on the same animal simultaneously, danger may occur which is arisen from the overlap of leakage current.
- CO poisoning will appear excessive estimation, so it is not recommended to use the device.
- This device is not intended for treatment.
- The intended operator of the device may be an animal.
- Avoid maintaining the device during using.
- Users should read the product manual carefully before use and operate according to the requirements.

1 Overview

The pulse oxygen saturation is the percentage of HbO2 in the total Hb in the blood, so-called the O2 concentration in the blood. It is an important bio-parameter for the respiration. For the purpose of measuring the SpO2 more easily and accurately, our company developed the Veterinary Pulse Oximeter. At the same time, the device can measure the pulse rate simultaneously.The Veterinary Pulse Oximeter features in small volume, low power consumption, convenient operation and being portable.

It is only necessary for animal to put tongue or ear into a probe for diagnosis, and a display screen will directly show the measured value of pulse oxygen saturation with the high veracity and repetition.

1.1. Features
A. Easy to use.
B. Small in volume, light in weight, convenient to carry.
C. Low power consumption.

1.2. Intended purpose
The Veterinary Pulse Oximeter can be used in measuring the pulse oxygen saturation and pulse rate through animal's tongue or ear and so on. The product is suitable for being used in family. (It is recommended to use the device when the animal is still.).

1.3 Environment requirements
Storage Environment
a) Temperature: -40 ℃ ~ + 60 ℃
b) Relative humidity: ≤ 95%
c) Atmospheric pressure: 500 hPa ~ 1060 hPa
Operating Environment
a) Temperature: +10 ℃~ + 40 ℃
b) Relative Humidity: ≤ 75%
c) Atmospheric pressure: 700 hPa ~ 1060 hPa

1.4 Precautions
1.4.1 Attention
Point out conditions or practices that may cause damage to the device or other properties.
- Before using the device, make sure that it locates in normal working state and operating environment.
- In order to get a more accurate measurement, it should be used in a quiet and comfortable environment.
- When the device is carried from cold or hot environment to warm or humid environment, please do not use it immediately, wait four hours at least is recommended.
- If the device is splashed or coagulated by water, please stop operating.
- DO NOT operate the device with sharp things.
- High temperature, high pressure, gas sterilizing or immersion disinfection for the device is not permitted. Refer to User Manual in the relative chapter (6.1) for cleaning and disinfection. Please take out the internal battery before cleaning and disinfection.
- The device is suitable for animal.
- The device may not be suitable for all animals, if you can't get a satisfactory result, please stop using it.
- Data averaging and signal processing have a delay in the upgrade of SpO2 data values. When the data update period is less than 30 seconds, the time for obtaining dynamic average values will increase, which is arisen from signal degradation, low perfusion or other interference, it depends on the PR value.
- The device has 3-year service life, date of manufacture sees the label.
- The expected service life of the attached parts or accessories of the equipment is two year.
- If the shelf life is less than the expected service life, the shelf life of the attached parts or accessories of the equipment is two year.
- The device does not provide over-limit alarm function for SpO2 and PR, so it is inapplicable for using in the place where need such function.
- This device has the function of prompting, users can check on this function according to chapter 6.1 as a reference.
- The device has the function of limits prompting, when the measured data is beyond the highest or lowest limit, the device would start prompting automatically on the premise of the prompting function is on.
- The device has the function of prompting, this function can either be paused, or closed for good. This function could be turned on through menu operation if you need. Please check the chapter 6.1 as a reference.
- The device hasn't low-voltage alarm function, it only shows the low-voltage, please change the battery when the battery voltage is used up.
- The maximum temperature at the SpO2 probe -tissue interface should be less than 41℃ which is measured by the temperature tester.
- During measuring, when abnormal conditions appear on the screen, please pull out the measured part and reinsert it to measure again.
- If some unknown error appears during measuring, remove the battery to terminate operating.
- Do not contort or drag the wire of the device.

- The plethysmographic waveform is not normalized, as a signal inadequacy indicator, when it is not smooth and stable, the accuracy of the measured value may degrade. When it tends to be smooth and stable, the measured value read is the optimal and the waveform at this time is also the most standard.
- If necessary, please visit our official website to get the information about SpO2 probe that can be used with this device.
- If the device or component is intended for single-use, then the repeated use of these parts will pose risks on the parameters and technical parameters of the equipment known to the manufacturer.
- If necessary, our company can provide some information (such as circuit diagrams, component lists, illustrations, etc.), so that the qualified technical personnel of the user can repair the device components designated by our company.
- The hair which is too long or too thick may affect the measure value.Please insert hair thin part enough into the probe ,or eliminate the hair of the part which will be measured.
- The measured part should be placed correctly (see Attached figure 6), as improper installation or improper contact position for sensor will influence the measurement.
- The light between the photoelectric receiving tube and the light-emitting tube of the device must pass through the animal's arteriole. Make sure the optical path is free from any optical obstacles like rubberized fabric, to avoid inaccurate results.
- Excessive ambient light may affect the measured 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 sensor properly and cover the sensor with opaque material.
- Frequent movement (active or passive) of the animal or severe activity can affect the measured accuracy.
- The SpO2 probe should not be placed on a limb with the blood pressure cuff, arterial ductus or intraluminal tube.
- The measured value may be inaccurate during defibrillation and in a short period after defibrillation, as it has not defibrillation function.
- The device has been calibrated before leaving factory.
- The device is calibrated to display functional oxygen saturation.
- The equipment connected with the Oximeter interface should comply with the requirements of IEC 60601-1.

1.4.2 Clinical restriction
A. As the measure is taken on the basis of arteriole pulse, substantial pulsating blood flow of animal is required. For a animal with weak pulse due to shock, low ambient/body temperature, major bleeding, or use of vascular contracting drug, the SpO2 waveform (PLETH) will decrease. In this case, the measurement will be more sensitive to interference.

B. The measurement will be influenced by intravascular staining agents (such as indocyanine green or methylene blue), skin pigmentation.

C. The measured value may be normal seemingly for the test animal who has anemia or dysfunctional hemoglobin(such as carboxyhaemoglobin (COHb), methaemoglobin (MetHb) and sulfhaemoglobin (SuHb)), but the test animal may appear hypoxia, it is recommended to perform further assessment according the clinical situations and symptoms.

D. Pulse oxygen only has a reference meaning for anemia and toxic hypoxia, as some severe anemia animal still show better pulse oxygen measured valued.

E. Contraindication:
  a. The animal who is allergic to silicone, PVC, TPU TPE or ABS.
  b. The damaged skin tissue.
  c. During cardiopulmonary resuscitation.
  d. When the animal is hypovolemic.
  e. For assessing the adequacy of ventilatory support.
  f. For detecting worsening lung function in animals on a high concentration of oxygen.

1.5 Clinical indications
The Veterinary Pulse Oximeter can be used in measuring the pulse oxygen saturation and pulse rate through tongue or ear.

2 Principle

An experience formula of data processing is established taking use of Lambert Beer Law according to Spectrum Absorption Characteristics of Reductive Hemoglobin (Hb) and Oxyhemoglobin (HbO2) in red light & near-infrared light zones. On the basis of the principle of Photoelectric Oxyhemoglobin Inspection Technology and Photoplethysmography technology, it uses two light beams of different wavelengths to irradiate the animal's tongue or ear to obtain the measurement information from the photosensitive element, after processed by the electronic circuits and microprocessor, displays the measured results on the screen.

Glow and Infrared-ray Emission Tube

Animal Tongue

Glow and Infrared-ray Receipt Tube
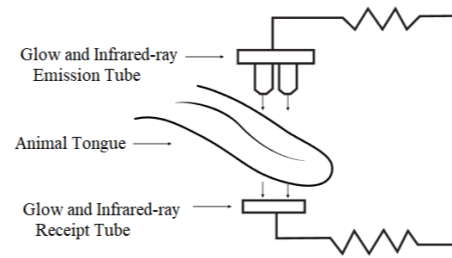
Figure 1

3 Functions
A. SpO2 value display
B. Pulse rate value display, bar graph display
C. Pulse waveform display

D. Low-voltage indication: low-voltage indicator appears before working abnormally which is due to low-voltage
E. Screen brightness can be changed
F. Pulse sound indication
G. With prompt function
H. With SpO2 value and pulse rate value record function,the stored data can be uploaded to computer
I. It can be connected with an external oximeter probe
J. Real-time data can be transmitted to computer
K. Review function
L. Clock function

4 Installation
4.1. View of the front panel

Probe jack
Sound prompt indication
SpO2 HI(%)
SpO2
SpO2 LO(%)
Power on/off button
Up button/replay button
Let button/prompt pause button
USB

Pulse sound indication
Battery status indication
Pulse rate
Pulse bar graph
Pulse waveform
Menu button
Right button/clock button
Down button
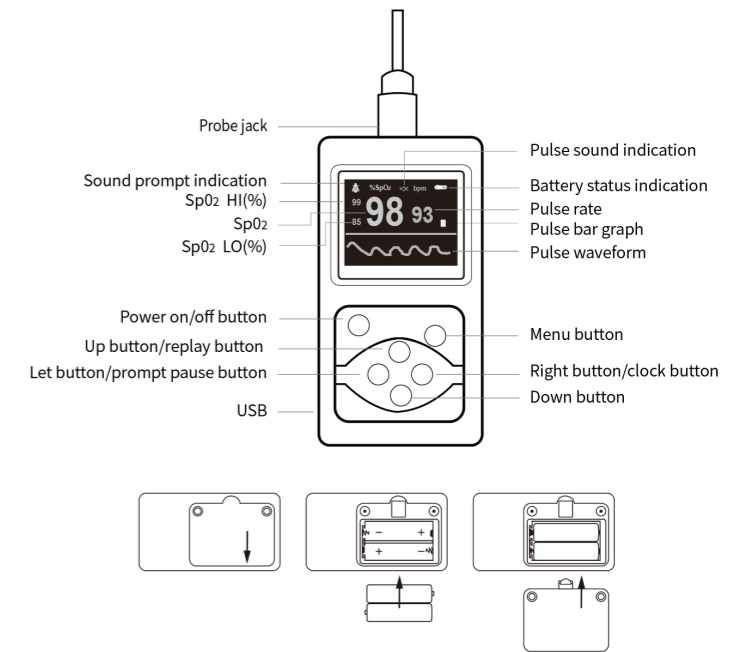
Figure 2. Front View

4.2. Battery installation

Figure 3. Batteries Installation

A. Refer to Figure 3. Use a screwdriver to unscrew the two screws from the battery compartment on the back of the product and open the back cover of the battery compartment.
B. Insert the two AA size batteries properly in the right direction.
C. Replace the cover, screw on the screw.
⚠ **Please take care when you insert the batteries, for the improper insertion may damage the device.**
⚠ **Please replace two new batteries of the same kind at the same time.**

4.3. Probe installation
Inserting the SpO2 probe of the Veterinary Pulse Oximete in the upper jack(see Figure 4). (The probe is limited to be produced by our company; never replace it with the similar one by other manufacturers).
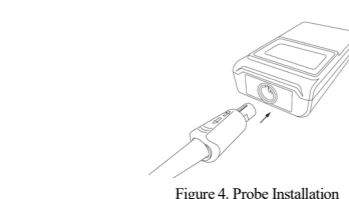
Figure 4. Probe Installation

USB
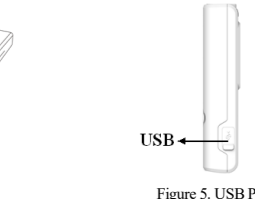
Figure 5. USB Port

⚠ **when inserting zhe probe, make the protruding part of the probe plug correspond to the groove of the probe socket. Pull out the probe directly and don't rotate the probe.**

4.4. USB port
It is used to connect a personal computer to export the trend data (see Figure 5).

4.5. Structure, accessories and software description
A. Structure: main unit, probe, USB cable.
B. Accessories: one animal-oximeter probe, two AA size batteries (optional), one USB cable, one CD disk (including PC software, optional), one User Manual.

⚠ **Please check the device and accessories according to the list to avoid that the device can not work normally.**

C. Software description
Release version: V2

5 Operating
5.1.Application method
A. Put the animal tongue enough into the animal nip of probe. Refer to Figure 6.

Figure 6

(The appearance of actual probe may be different with the one shown as Figure 6, please refer to the actual probe.)

B. Long press the "power on/off " button, until the device turns on.

C. Do not shake during the measurement to keep the animal in a stable state.

D. Wait a few seconds, The data can be read directly from the screen in the measure interface.

5.2 Pause sound prompt

A. Sound prompt, including: over-limit, low-battery and probe out of position.

B. Under the measurement interface, turn on the sound prompt, when the sound prompt occurs, short press the left key to pause the sound prompt, and it will resume automatically after about 60s.

C. If you want to turn off the sound prompt permanently, please set it in menu.

5.3 Review Interface

A. In the measure interface,press "up button" to enter the Review Interface 1 directly, as shown in Figure 7:

Figure 7-1. Review Interface 1   Figure 7-2. Review Interface 2

B. In review interface, press "menu button" to switch between Review Interface 1 and Review Interface 2.

C. In Review Interface 1, the user can observe the trend waveform composed by storage data. Each screen can show storage data for 105 seconds. The yellow line shows the SpO2 trend waveform,and the red line shows the PR trend waveform. The time underside shows the starting time of displaying the date in the screen, press the "left button" or "right button" to view the information on the previous or next page of the stored data trend chart.

D. The Review Interface 2 shown based in Review Interface 1, the stored SpO2 value and PR value in each second can be observed here, the underside date from left to right marks time, SpO2 value, PR value. Press "left button" or "right button" to display the blood oxygen and pulse of the previous or next second; Long press the "left button" or "right button", and the pulse and blood oxygen will be display with a data interval of 10 seconds.

E. Press "up button" to exit the review Interface, return to the measure interface.

5.4 Clock interface

In the measure interface, press the "right button" can enter the clock interface of Figure 8. Press the "right button" again can return to the measure interface.

Figure 8. Clock interface   Figure 9. Main Menu   Figure 10 Setting for sound prompt

5.5 Menu operations:

In the measure interface, press the "menu button "can enter the menu of Figure 9.Users can adjust the setting through the main menu, such as the sound prompt, record, clock, system, etc. can be set, methods are as followings:

5.5.1 Sound prompt setting

Under main menu, press the "up button" or "down button" to select "Prompt", then press the "left button" or "right button" to enter its setting interface shown in Figure 10.

Press the "up button" or "down button" to select the option to be adjusted, then press the "left button" or "right button" to change the value.

"SpO2 HI(%)": upper limit prompt for SpO2 over-limit
"SpO2 LO(%)": lower limit prompt for SpO2 over-limit
"PR HI(bpm)": upper limit prompt for PR over-limit
"PR LO(bpm)": lower limit prompt for PR over-limit
"Prompt Sound": prompt for over-limit, "off": close, "on": open.
"Pulse Sound": PR sound, "off": close, "on": open.

Lower limit can not exceed the upper limit, and the upper limit can not be lower than the lower limit when adjusting the values. SpO2 range: 0 % ~ 100 %, PR range: 0 ~ 254 bpm。

The values displayed in Figure 10 are the initial values of over-limit prompt.

After setting, press the "menu button" to exit the Prompt Settings Menu interface, and return to "Main Menu" interface.

5.5.2 Data storage

Under the main menu, press the "up button" or "down button" to select "Record", then press the "left button" or "right button" to enter the "Record Menu" interface as shown in Figure 11.

Press the "up button" or "down button" to select the option to be adjusted, then press the "left button" or "right button" to change the value.

It indicates that the device is storing when the red dot "REC●" in measurement interface flickers.

"Mode": record mode selection, including: "Auto" and "Manual" mode. Under "Manual" mode, select to turn on /

off memory by "Record".

Auto record: start recording after stable data appear, pull out the finger to finish recording a group of data (99 group of data at most), the total duration does not exceed 72 hours.

Manual record: after manual storage is started, the storage state needs to be terminated manually to complete a group of store, store up to 24-hour data.

When the memory is full, it will display "Memory is full!", then it will enter the standby mode after several seconds. When exiting the standby mode next time, it will display "Memory is full!" to prompt user that the memory has been full, then it will enter the measure interface.

⚠ **Under manual mode, when "Record" is "ON", the device will prompt to clear the data stored last time.**

It will display "Recording..." when there is no operation under record state for 15s, then it will enter energy saving mode after several seconds, pressing the "power on/off button", the device would return to the measure interface; pressing any button(power on/off excluded), it will display "Recording...".

⚠ **Under data recording state, after the display screen turns off automatically, in order to save power, pulse sound indication will turn off automatically.**

"Seg": data segment.

After setting, press the "menu button" to exit storage menu, return to main menu.

"Delete All": delete all records (auto record mode is shown as Figure 11).

⚠ **Please upload data in time after recording, otherwise the data may be covered when the storage space is full.**

⚠**The historical data will be deleted once switching the mode. Under record state, the record mode can not be switched; under manual mode, the record mode can be switched only when turning off recording firstly.**

Figure 11 Record menu   Figure 12 Clock menu   Figure 13 System menu

5.5.3 Clock setting

a. Connect the master device to synchronize device time

Under the PC software interface, after search for the device, then can synchronize the device time.

b. Set device time manually

Under main menu, press the "up button" or "down button" to select "Clock", then press the "left button" or "right button" to enter its setting interface shown in Figure 12.

Press the "up button" or "down button" to select the option to be adjusted, then press the "left button" or "right button" to change the value.

"Set Time": set the time, "Yes": allow, "No": prohibit
"Set Year": set the year
"Set Month": set the month
"Set Day": set the day
"Set Hour": set the hour
"Set Minute": set the minute

Adjustable range for year: 2015 ~ 2045, month: 1 ~ 12, day: 1 ~ 30 (when there are 31 days in a month, it is 1 ~ 31), hour: 1 ~ 23, minute: 1 ~ 59.

After setting, press the "menu button" to exit clock menu, return to main menu.

5.5.4 System setting and other options introduction

Under main menu, press the "up button" or "down button" to select "System", then press the "left button" or "right button" to enter the interface as shown in Figure 13.

Press the "up button" or "down button" to select the option to be adjusted, then press the "left button" or "right button" to change the value.

"Hard.Ver.": hardware version
"Soft.Ver.": software version
"ID": user name
"Demo": set the Demo mode, "on": turn on the Demo mode, "off": turn off the Demo mode.
"Sound Volume": set the sound volume, adjustable range: 1 ~ 3
"Brightness": set the screen brightness, adjustable range: 1 ~ 4

After setting, press the "menu button" to exit system setting menu, return to main menu.

5.5.5 Exit main menu

Under main menu, press the "menu button" to exit the main menu and return to the measurement interface.

5.6 Data upload

Connect the device to the computer by the USB cable,upload the data after connecting the PC software properly, refer to "Software operating instruction" for details.

⚠ **The PC software can be downloaded from our official website.**

5.7 Power off

Long press the "power on/off" button,until the device turns off.

⚠ **when the device is in storing , it can't be turned off.**

6 Maintain, Transport and Storage

6.1. Cleaning and disinfection

Please take out the internal battery before cleaning , do not immerse it into liquid.

Use 75% alcohol to wipe the device enclosure and the nail pad, nature dry or clean it with clean and soft cloth. Do not spray any liquid on the device directly, and avoid liquid penetrating into the device.

6.2. Maintenance

A. Check the main unit and all accessories periodically to make sure that there is no visible damage that may affect animal's safety and monitoring performance. It is recommended that the device should be inspected weekly at least. When there is obvious damage, stop using it.

B. Please clean and disinfect the device before/after using it according to the User Manual (6.1)

C. Please replace the batteries in time when low-battery appears.

D. Please take out the batteries if the device is not used for a long time.

6.3. Transport and Storage

A. The packed device can be transported by ordinary conveyance or according to transport contract. During transportation, avoid strong shock, vibration and splashing with rain or snow, and it can not be transported mixed with toxic, harmful, corrosive material.

B. The packed device should be stored in room with no corrosive gases and good ventilation. Temperature: -40°C~+60°C; Relative humidity: ≤95%.

7 Troubleshooting

Trouble	Possible Reason	Solution
The values can not be displayed normally or stably.	1. The measured part is not properly inserted. 2. The animal's SpO2 is too low to be detected. 3. The measured part is shaking or the animal is moving. 4. The device is not used in environment required by the manual. 5. The device works abnormally.	1. Please insert the measured part properly and measure again. 2. Try again; Go to a hospital for a diagnosis if you are sure the device works all right. 3. Let the animal keep still. 4. Please use the device in normal environment. 5. Please contact the after-sales.
The device can not be turned on.	1. The battery is drained away or almost drained away. 2. The battery is installed incorrectly. 3. The device's malfunction.	1. Please change batteries. 2. Please install the battery again. 3. Please contact the local service center.
The display disappears suddenly.	1. The device enters into the energy saving mode. 2. Low battery. 3. The device works abnormally.	1. Normal. 2. Please change batteries. 3. Please contact the after-sales.
The data can not be stored.	1. The device is not operated according to the manual. 2. The device works abnormally.	1. Please operate the device according to the manual. 2. Please contact the after-sales.

8 symbols

Symbols	Meaning	Symbols	Meaning
	Follow instructions for use		left button/prompt pause button
%SpO2	Pulse oxygen saturation (%)		Menu button
PRbpm	Pulse rate (bpm)		Right button/clock button
	Close the prompt sound indication	▽	down button
	Pause the prompt sound indication		Up button/replay button
	Open the prompt sound indication		USB
	Close the pulse sound indication		Type BF applied part
	Open the pulse sound indication	SN	Serial number
	The battery power is full	---	1. Don't find measured part 2. Probe error 3. Signal inadequacy indicator
	Two grid of the battery	Sensor off	1. Don't find measured part 2. Probe error
	One grid of the battery		Alarm inhibit
	The lack of battery power.(Please change batteries in time for exact measuring)		Manufacturer
	Power on/off button		Date of manufacture
+	Battery anode	—	Battery cathode
	Temperature limit		Atmospheric pressure limit
	Humidity limit		This way up
	Fragile, handle with care		Keep in a cool, dry place
IP22	Covering Protection rate		Recyclable

	WEEE disposal		Expiration date
REC●	Recording	P/N	Material code
Sensor Fault	Probe failure	EC REP	European Representative
LOT	Lot number	CE	Product complies with European Directive

Note：Your device may not contain all the following symbols.

9 specification

SpO2	
Display range	0% ~ 100%
Measured range	0% ~ 100%
Accuracy	70%~100%: ±2%; 0%~69%: unspecified.
Resolution	1%
PR	
Display range	30 bpm ~ 250 bpm
Measured range	30 bpm ~ 250 bpm
Accuracy	±2 bpm during the pulse rate range of 30 bpm ~ 99 bpm and ±2% during the pulse rate range of 100 bpm ~ 250 bpm.
Resolution	1 bpm
Accuracy under low perfusion	Low perfusion 0.4%: SpO2: ±4%; PR: ±2 bpm during the pulse rate range of 30 bpm ~ 99 bpm and ±2% during the pulse rate range of 100 bpm ~ 250 bpm.
Light interference	Under normal and ambient light conditions, the SpO2 deviation ≤ 1%
Pulse intensity	Continuous bar graph display, the higher display indicates the stronger pulse.
Upper and lower limit of measured values	
SpO2	0% ~ 100%
PR	0 bpm ~ 254 bpm
Optical sensor	
Red light	Wavelength: about 660 nm, optical output power: < 6.65 mW
Infrared light	Wavelength: about 905 nm, optical output power: < 6.75 mW
Memory	Up to 99 group of data under auto mode, total duration does not exceed 72 hours. Up to 24-hour data under manual mode.
Safety class	Internally powered equipment, type BF applied part
International Protection	IP22
Working voltage	DC 2.6 V - 3.6 V
Working current	≤ 100 mA
Battery Requirement	Dry battery(2AA)
Operation time	The device can continuously work for 20 hours when it was powered by two new batteries within the warranty period.
Dimension and Weight	
Dimension	110(L) × 60(W) × 24(H) mm
Weight	About 120g (with Dry battery(2AA))

Appendix

State	Prompt condition delay	Prompt signal generation delay
Low voltage prompt	1s	20ms
SpO2 prompt	330ms	20ms
Pulse rate prompt	330ms	20ms
Probe error prompt	16ms	20ms

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.

CONDIZIONI DI GARANZIA GIMA

Si applica la garanzia B2B standard Gima di 12 mesi.