User Manual

Finger Pulse Oximeter

The finger pulse oximeter produced by our company is a kind of noninvasive and continuous instrument for detecting the arterial oxygen saturation and pulse rate of human body. It is portable and can accurately and rapidly measure the blood oxygen, so that you know whether you are lack of oxygen at present.

Summary

Blood oxygen saturation is the percentage of the capacity of HBO2 in the blood which is combined with oxygen in the total capacity of Hb. That is, the concentration of blood oxygen, which is a very important physiological parameter of the respiratory and circulatory system. Many respiratory diseases can cause the decrease of oxygen saturation. In addition, the dysfunction of the body's automatic regulation caused by anesthesia, surgical trauma and some injuries caused by examination may lead to the patient's oxygen supply problems and reduce the human oxygen saturation, resulting in some adverse reactions such as vertigo, vomiting, weakness and other symptoms. If the treatment measures are not taken in time, the patients' lives will be endangered. Therefore, it is very important for doctors to find out the problem in time by knowing the patient's oxygen saturation in time.

◆The finger clip type pulse oximeter (hereinafter referred to as the oximeter) has the advantages of small volume, low power consumption, simple operation and convenient carrying. When measuring, as long as the finger is extended into the finger clamp photoelectric sensor, the display screen will directly display the measured blood oxygen saturation value.

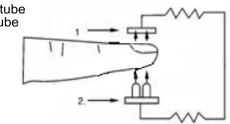
◆Measurement principle

◆The measurement principle of the oximeter is based on the spectral characteristics of hemoglobin and oxyhemoglobin with different absorption rates in the red and infrared light areas, and the empirical formula of data is established by using "lamert beer" law. The working principle of the instrument is to use photoelectric blood oxygen detection technology combined with volume pulse tracing technology. Two different wavelengths of light (660nm red light and 940nm near-infrared light) are used to irradiate the fingernail of human body through absorption perspective clip sensor, and the measurement signal is obtained by the photosensitive element. The obtained information is displayed on the display after the electronic circuit and microprocessor, which is easy to read.

◆It is composed of double-layer components and photoelectric detector. Bone, cell tissue, pigmentation and vein vessels all have different absorption constants of light. When the artery pulsates with the heart's contraction and relaxation, the absorption of light will be different with the increase and decrease of blood flow. The absorptivity of different light during diastole and contraction of the heart is transformed into the measurement result of blood oxygen saturation. This measurement is the oxygen saturation.

Schematic diagram of operation

1. Infrared receiving tube
2. Infrared emitting tube



Safety warning

1. It can not be used together with MRI or CT equipment.
2. Explosion hazard: do not use this instrument in the environment of flammable anesthetic gas.
3. The oximeter only plays an auxiliary role in the diagnosis of the patient. Please ask the doctor to make a diagnosis based on the clinical manifestations and symptoms.
4. Always check the sensor test point of the oximeter to confirm that the patient's skin at the sensor test point is complete and in good circulation.
5. The sensor of the finger clip pulse oximeter is not suitable to contact the adhesive tape, which may cause the measurement data error or mistakenly think that the tested skin has blisters.
6. Please read this manual carefully before use.

7. The oximeter does not have the function of blood oxygen prompt, but it can not be used as a long-term continuous monitor.
8. When using for a long time, please change the test point periodically according to the different situation of the patient. The test point must be replaced every 2 hours at most and the skin integrity, circulation and correct adjustment of the patient must be checked.
9. High pressure disinfection, vinyl oxide disinfectant or immersion of the sensor in the liquid disinfectant will cause incorrect readings.
10. Dysfunction of important indicators of hemoglobin (such as carbohemoglobin or methemoglobin) can cause incorrect readings.
11. Excessive staining in blood vessels, such as indocyanine green or methylene blue, may cause incorrect readings.
12. The measurement accuracy of blood oxygen saturation will be affected by the strong light of the surrounding environment. (e.g. wipes or direct sunlight) add a protective enclosure to the sensor if necessary.
13. The patient's unexpected movements may cause incorrect readings.
14. The interference of high frequency signal or defibrillator may cause wrong reading.
15. Rhythmic pulsation of the vein can cause incorrect readings.
16. Patients with hypotension, severe systolic hypotension, severe anemia or hypothermia may cause incorrect readings
17. If the patient uses a cardiotonic after the heart stops beating, or if the patient shivers, it will cause a wrong reading
18.bright nails or nail polish coated nails cause erroneous readings.
★ the recyclable accessories or components of accessories in the equipment specified in the manual, including batteries, shall comply with local laws and regulations.

Product features

◆The product adopts four-color screen display, and the interface can display four different display modes;
◆The power consumption of the product is low, and the two AAA batteries can be used for more than 15 hours;
◆When the battery voltage is too low which may affect normal use, there is a low voltage warning indication;
◆When no signal, the product will enter the shutdown state after 8 seconds;
◆Small size, light weight and very easy to carry.

Product scope of application

This product is suitable for monitoring the pulse oxygen saturation and pulse rate of patients.
This product is not recommended for use during exercise and is not suitable for continuous monitoring of patients.
This product is not applicable to infants and newborns

Method of use

1. Install 2pcs AAA batteries according to the positive and negative marks of the battery compartment and directly fasten the battery cover;
2. Insert the finger into the rubber hole (the finger should be fully extended), with the nail facing up, and then release the clamp;
3. Press the button in the middle of the front panel to start the oximeter for blood oxygen detection;
4. In the use process, it is better not to shake your fingers, and the human body should not be in motion;
5. If you want to change the display direction during use, press the button in the middle of the front panel;
6. read the relevant data directly from the display;
7.The instrument has sleep function, and it will enter standby sleep state if no signal is generated;
8.When the battery power is low, the low battery power indication will appear on the LCD, prompting the user to replace the battery.

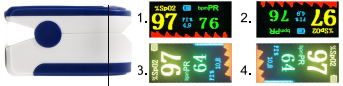
Report errors

Fingernails must be up when inserting fingers

Declaration: before using this product for testing, please use alcohol to wipe the rubber of finger sleeve first, and use alcohol to wipe the tested finger before and after using. (the rubber material is rubber, which is non-toxic, harmless and has no side effects such as allergy to human skin.)

Brief introduction of the whole machine

◆Front and back panel ◆LCD display mode



◆Power on / mode key

Key function description: in the standby mode, start the key instrument to enter the working mode, and press the key in the working mode to change the display mode.

Technical specifications

1. Display mode: LCD four color display
2. Pulse oxygen saturation display range: 70% - 99%
3. Blood oxygen saturation: measurement accuracy: within the range of 70% - 99% ± 2%, < 70%, no definition of accuracy
Resolution: blood oxygen saturation ± 1%
4. Pulse rate: 25bpm ~ 250bpm
Measurement accuracy: ± 1bpm or ± 1% of the measured value (whichever is greater)
5. Battery model: 2 AAA 1.5V alkaline batteries;
6. Automatic shutdown: when no finger is inserted, it will be automatically shutdown after 8 seconds
7. Boundary dimension: 58mm × 32mm × 34mm
8. Operating environment: operating temperature: 5 ℃ ~ 40 ℃
Storage temperature: - 10 ℃ ~ 40 ℃
Environmental humidity: 15% - 80% storage when working
Atmospheric pressure: 70kpa ~ 106kpa
9. Declaration: EMC of this product complies with iec60601-1-1-2 standard.
10. Pulse wave measurement sensitivity under the condition of weak perfusion: the necessary test equipment (bio-tek index pulse oximeter) can measure the available pulse wave signal whose amplitude is 6% of the amplitude of analog pulse wave signal.
11. Anti environment light interference ability: apply interference signal test with bio-tek index pulse oximeter tester, the instrument can work normally

Product classification

1. According to the management category of devices, it is divided into: Class II equipment
2. It can be divided into: internal power supply equipment according to the type of anti electric shock
3. According to the degree of anti electric shock: BF type

Maintenance and preservation

1. When the low voltage indicator is on, please replace the battery immediately
2. Please scrub the surface of the oximeter before use
3. If you do not use the oximeter for a long time, please take out the battery inside
4. The product is best stored in the environment with the ambient temperature of - 10 to 40℃ (14 to 104℉) and the humidity of 10% to 80%
5. The product must be kept dry at all times. The humid surrounding environment may affect the service life of the product or even damage the product
6.Please handle the used batteries according to the laws and regulations of the local government

Spare parts

1. 1pcs lanyard
2. 1pcs User manual

Product statement - electromagnetic radiation - for other equipment and systems

The oximeter is designed to be used in a specific electromagnetic environment. The user must ensure that the product is used in the following environment

Radiation test	Basis	Electromagnetic environment - Guidance
RF interference CISPR 11	Group 1	The RF signal of the oximeter is only generated by the internal function, so its RF interference is very low and will not interfere with the surrounding electrical equipment.
RF interference CISPR 11	Class B	The oximeter is applicable to all institutions, including communities and domestic buildings directly connected to the public low-voltage power supply network.

Possible problems and Solutions

Problem	Potential reason	solution
Abnormal display of blood oxygen or heart rate	1.Fingers are not put in correctly 2.The patient's blood oxygen value is too low to be detected	1. Put the finger in correctly and try again 2. Please try several times. If you confirm that the product has no quality problem, please go to the hospital for diagnosis
Blood oxygen or heart rate is unstable	1. Fingers putting not deep enough 2. Fingers shaking or human body moving	1. Please put your finger in correctly and try again 2. Please try to keep your body still
Unable to power on	1. The battery may be low or dead 2. The battery may not be installed correctly 3. The machine may be damaged	1. Please replace the battery 2. Please reinstall the battery 3. Please contact the local customer service center
The display light goes out suddenly	1. The product is set to stand by after 8 seconds when there is no detection signal 2. Low battery	1. Normal 2. Please replace the battery

Symbols and meanings

Symbol	Meaning
	Equipment type is BF type
	Please refer to the manual before use
PI	Perfusion Index
%SpO2	Blood oxygen saturation
PR BPM	Pulse rate (beats per minute)
	Low voltage indication
SN	Serial number

We reserve the right to change the technical appearance of this product without notice.