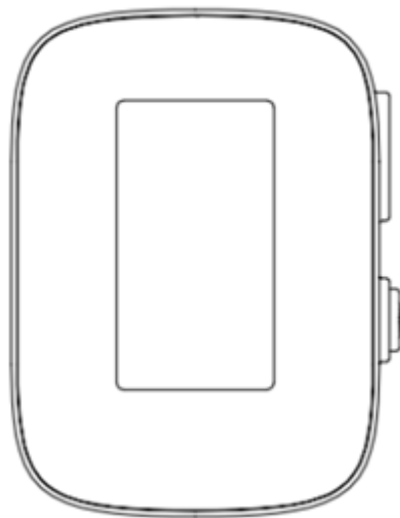


Pulse oximeter

WO2/WPO-11/WO2A/WPO-10

User's manual



Dear Customer, We sincerely appreciate your purchase of the WO2/WPO-11/WO2A/WPO-10 pulse oximeter (hereinafter referred to as the oximeter) manufactured by our company. As a precision measurement instrument, the oximeter requires careful handling and proper use by the user. Before commencing operation, please thoroughly review the user manual and adhere to all specified instructions.

This manual is prepared by our company and is protected by copyright. No reproduction, alteration, or unauthorized modification is permitted. The version upgrade of this user manual will not be tracked or updated.

The images in this manual are for reference only and may not fully match the actual product display.

Version number of the specification: V1.0

Revision date: September 15,2025



Warning: A message to prevent user injury



Note: Warning information to prevent damage to the pulse oximeter

Note: Important instructions for operation and use

FCC STATEMENT

1. This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference.

(2) This device must accept any interference received, including interference that may cause undesired operation.

2. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient or relocate the receiving antenna.

Increase the separation between the equipment and receiver.

Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for help.

warning :

- ⚠ Do not use during MRI (magnetic resonance imaging).
- ⚠ Continued use can cause discomfort or tenderness, especially in patients with microcirculatory disorders.
- ⚠ Before each use, please check whether the pulse oximeter is normal. Do not use the damaged pulse oximeter!
- ⚠ Check the wearing area every 1 to 2 hours to ensure good skin texture and correct light alignment. If the skin texture changes, move the pulse oximeter to another area. Change the wearing area at least every 3 hours.
- ⚠ Do not place an oximeter on a limb with an artery or intravenous infusion tube. This will result in incorrect measurements.
- ⚠ Do not look directly at the light source of the blood oxygen probe (infrared light is invisible), otherwise it may be harmful to the eyes.
- ⚠ Although all parts expected to come into contact with the human body have been evaluated biologically and are biologically safe, a very few people may have allergic reactions and should stop using them for patients with allergic reactions.
- ⚠ The probe of the pulse oximeter is a special accessory. The user needs to verify the compatibility between the pulse oximeter and the probe before use to ensure that it can be used safely and work normally after matching. Incompatible accessories will lead to the performance decline of the pulse oximeter.

☛ The accuracy of the oximeter measurement may be affected when the clinician operates the oximeter with peak wavelength equipment (such as photodynamic therapy equipment).

☛ Various accessories of this instrument cannot be replaced at will. If replacement is necessary, the manufacturer-recommended accessories or those from the same model, manufacturer, and standard as the one that came with this pulse oximeter should be used; otherwise, it may lead to adverse consequences regarding safety, performance, electromagnetic compatibility, and biocompatibility. For manufacturer-recommended accessories, please refer to the "List of Recommended Accessories Specifications."

☛ For the purpose of preventing environmental pollution, the disposal of this product and accessories and packaging waste shall comply with local laws and regulations.

☛ The blood oxygen meter contains precision devices, and the user should not open the instrument shell without authorization.

☛ The functional tester cannot be used to evaluate the accuracy of pulse oximeter or pulse oximeter.

☛ Keep the equipment and all accessories out of reach of pets, insects and children to avoid injury or damage to the equipment.

☛ The application part of this device includes the silicone sleeve and probe shell in the blood oxygen probe.

☛ The pulse oximeter has no alarm system and is not suitable for "alarm state delay and alarm signal generation delay in any optional operating mode (which affects these properties)".

- ⚠️ This product should be used in a quiet, comfortable indoor environment for more accurate measurement.
- ⚠️ Do not use this product immediately when it is transferred from a cold environment to a warm and humid environment.
- ⚠️ Data averaging and signal processing delay the display and transmission of SpO₂ data values. The measurement data update cycle is less than 10 seconds, and when signal attenuation, weak perfusion, or other interference occurs, the time to take a dynamic mean increases, depending on the pulse rate.
- ⚠️ The service life of the product host is five years. Please refer to the attachment label for the service life of the attachment and the production date on the label.
- ⚠️ The maximum temperature of the contact surface of this product with the human body does not exceed 41°C, which is measured by the temperature measuring instrument.
- ⚠️ If unknown errors occur in the use of this product, you can disassemble the battery to terminate the operation of the product.
- ⚠️ When some abnormal conditions appear on the screen during the measurement, the probe is re-bundled for measurement.
- ⚠️ Do not twist or pull the wiring connecting this product.
- ⚠️ When the signal is incomplete (the signal noise is too large or the signal becomes poor or disappears), the accuracy of the measured value may decrease, and the display shows "- -".
- ⚠️ The measurement site is too cold, which may affect the measurement value.

-
- ☛ The light between the photoelectric receiver and the light-emitting tube of this product must pass through the small artery of the person under test; there should be no light obstacles such as tape in the place where the optical path passes, otherwise the measurement value may be inaccurate.
 - ☛ Excessive ambient light can affect measurements, such as surgical lights (especially xenon sources), bilirubin lamps, fluorescent lights, infrared heating lamps, and direct sunlight. To prevent interference from ambient light, ensure the pulse oximeter probe is properly placed and shielded with opaque material. To avoid excessive ambient light affecting the measurement, use it in a room with dimmer lighting.)
 - ☛ Excessive movement (active or passive) or vigorous activity of the subject can affect the accuracy of measurement.
 - ☛ Do not place the pulse oximeter on a limb with a blood pressure cuff, arterial catheter, or intracardiac tubing for measurement.
 - ☛ This product does not have defibrillation function, and the measurement value may be inaccurate during and shortly after defibrillation.
 - ☛ The device has been evaluated to meet general RF exposure requirement. The device can be used in portable exposure condition without restriction.

Contraindications: For certain special patients, the measurement site should be examined more carefully, and this product should not be placed on edema or fragile tissue.

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1. Overview

1.1 Product Name and Model

Name: Pulse Oximeter Model: WO2, WPO-11, WO2A, WPO-10

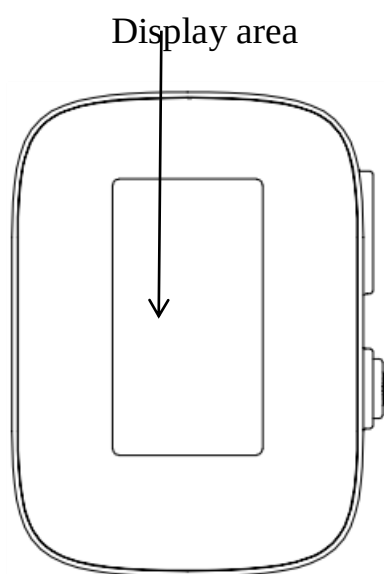
1.2 Product Structure and Composition

It is mainly composed of pulse oximeter host and pulse oximeter probe.

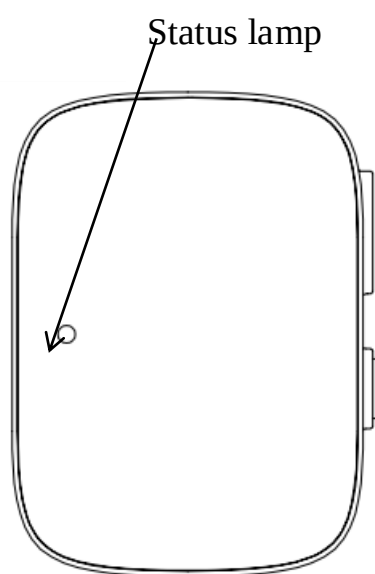
1.3 Product Features

- The design is light, easy to operate and easy to carry.
- High-definition color display with electronic clock functionality, supports multi-directional image display(excluding WO2A and WPO-10 models).
- It can simultaneously measure pulse oximetry (SpO2), pulse rate (PR), and blood flow perfusion index (PI).
- It can store up to 16 hours of blood oxygen data.
- The intelligent power management has the function of low voltage prompt.
- It has automatic shutdown function.
- It has an over-limit vibration alert function (except WPO-10).
- It has a power-saving mode.

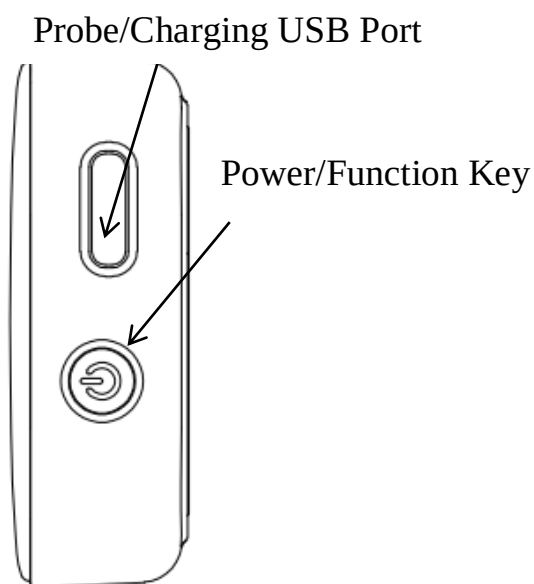
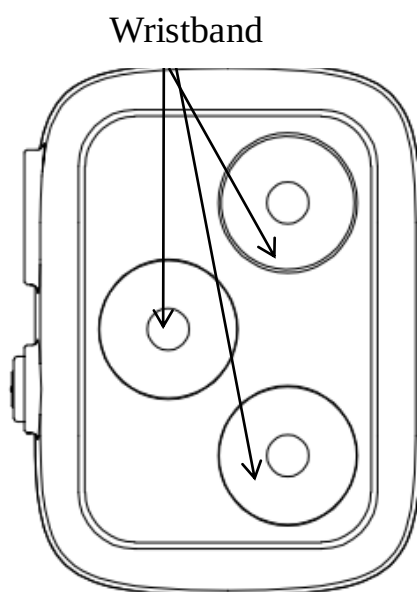
1.4 Appearance Introduction



WO2/WPO-11



WO2A/WPO-10



Back view and side view of WO2/WPO-11/WO2A/WPO-10

Display area: Shows monitoring parameters and settings.

Status light (applicable only to WO2A/WPO-10):

state	Green light (flashing)	Green light (always on)	Yellow light (flashing)	Yellow light (not on)
Device status	Low battery	/	Wireless not connected	Wireless connected
Device charging status	Charging in progress	The battery is fully charged.	/	/

Cable clip: Works with the wrist strap to secure the wearing position.

Probe/charging USB port: Insert the pulse oximeter probe to measure blood oxygen parameters, or connect the USB cable for charging when the battery is low.

Power/Function key : To power on/off or confirm function selection.

state	Shut down state	measuring condition (Excluding WO2A and WPO-10)	non-measured state (Excluding WO2A and WPO-10)
Long press	Device startup	Go to the menu	Go to the menu
Short press	/	Rotate the screen clockwise	/

Note: Long press----hold the button for about 2 seconds before releasing; Short press----release the button immediately

1.5 Product Features

product model Feature configuration	WO2	WPO-11	WO2A	WPO-10
display screen	√	√	×	×
auto shut off	√	√	√	√
Low voltage alert	√	√	√	√
SpO2、PR、PI	√	√	×	×
Pulse intensity histogram	√	√	×	×
pulse volume wave	√	√	×	×
exceeding limit vibration indication	√	√	√	×

product model Feature configuration	WO2	WPO-11	WO2A	WPO-10
Menu Settings	√	×	×	×
data storage	√	√	√	√
Wireless transmission	√	√	√	√

1.6 Scope of Application

For hospitals or families to monitor the patient's pulse oximetry and pulse rate.

1.7 Working Environment

- a) Ambient temperature range: 5°C to 40°C
- b) Relative humidity range: 15%–90%, non-condensing
- c) Atmospheric pressure range: 70 kPa to 106 kPa

1.8 Transportation and Storage Environmental Conditions

- a) Ambient temperature range: -20°C to +55°C
- b) Relative humidity range: 10% to 95%
- c) Atmospheric pressure range: 50 kPa to 106 kPa

1.9 Transport and storage conditions between two uses

- a) Ambient temperature range: -20°C to +55°C
- b) Relative humidity range: 10% to 95%
- c) Atmospheric pressure range: 50 kPa to 106 kPa

1.10 Symbolic Identification

symbol	meaning	symbol	meaning
%SpO2	degree of blood oxygen saturation (%)	PR bpm	Pulse rate (bpm, beats per minute)
PI%	perfusion index (%)		No alarm system
	Pulse strength histogram		Pulsation marker
	battery capacity		low voltage indication
	charging sign		Standby (Power On/Off)
	live time		serial number
	Wireless identification		This component is of BF type
	Storage full		Read the instructions
	Vibration on		Vibration off
	fragile		Rainy
	upward		temperature extremes
	hygroscopic limit		atmospheric pressure limit
	warn	IP68*	outer protection rating
	Follow the operating instructions (as per the user manual)		
	Indicates mandatory requirements, with specific details shown nearby in text or images. The left image shows "general mandatory".		
	Indicates a prohibition (something not allowed). The specific prohibition is shown nearby in text or pictures. The left image shows "general prohibition".		
Note: IP68* dust and water resistance indicates compliance with the IP68 rating under controlled laboratory conditions as specified in GB/T4208-2017 (IEC60529). Test conditions are: ① No flowing water, with a depth of 1.1 meters; ② Test duration: 30 minutes; ③ Temperature difference between water and product: ≤5°C; ④ Water and dust resistance is not permanent, and protective performance may degrade due to daily wear; ⑤ Do not charge the device in humid conditions, as damage caused by liquid immersion is not covered by warranty. For maintenance and care, refer to this manual.			

1.11 Network Security

The data electronic interface of this product software is a wireless communication interface. The data types contained in this device software are non-sensitive medical data.

The software of pulse oximeter is run on the closed embedded development platform.

a) data interface

The data interface transmission protocol for the wireless data upload function of the pulse oximeter is standard Bluetooth 4.0 or higher to ensure confidentiality, integrity, and availability of data throughout its entire lifecycle from acquisition to access. All monitoring data is stored in the local backup of the pulse oximeter.

b) User Access Control

You need to use our company's dedicated client software to view.

2. Supply electricity

➤ Internal power source: rechargeable lithium battery (rated voltage 3.7V DC, 100mAh)

➤ Ensure the power adapter meets the following specifications:

Use an adapter compliant with IEC60601-1 (GB9706.1) for charging.

Input: AC 100-240V 50/60Hz 0.5A Output : DC5V1A

3. Clinical limitation

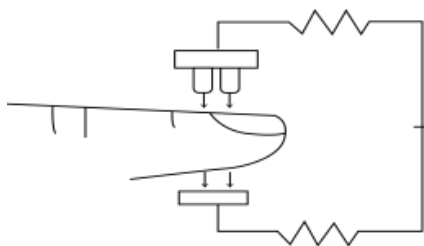
(1) The measurement is based on small arterial pulsations, and the subject must have minimal pulsatile blood flow. Due to shock, cold or hypothermia,

massive blood loss, arterial occlusion, or the use of vasoconstrictive agents, the pulse perfusion becomes weaker, the volume 描记 waveform becomes smaller, and the measurement becomes more susceptible to interference.

(2) Intravascular dyes (e.g., indigo, azurite, or methylene blue), skin pigmentation, and topical dyes (e.g., nail polish, hair dyes, or colored skincare products) may interfere with measurements.

(3) If the subject has anemia or exhibits hemoglobin with significant functional impairment (e.g., carboxyhemoglobin, methemoglobin, or methemoglobin), the measured values may appear normal, but the subject may be experiencing hypoxia. Further evaluation should be conducted based on clinical manifestations and symptoms.

4. Measuring principle



This product is based on the theoretical principles of the absorption spectrum characteristics of reduced hemoglobin (Hb)

and oxygenated hemoglobin (HbO₂) in the red and near-infrared light regions, utilizing Lambert-Beer's law to establish empirical data processing formulas. It employs photoelectric oxygen detection technology combined with volume pulse wave analysis technology, where two light beams of different wavelengths are irradiated on the fingertip of the human body, and the measurement signals are acquired by a photosensitive element. The

obtained information is processed by electronic circuits and a microprocessor, with the results displayed on a screen.

After the device is powered on, connect the pulse oximeter probe and insert it into the finger to begin measurement.

5. Preparation before use

5.1 Unboxing and Inspection

Before opening the package, carefully inspect the packaging. If any damage is found, contact the carrier immediately. Open the package using the correct method, carefully remove the equipment and other components, and check each item against the packing list. Inspect the equipment for mechanical damage and ensure all items are present. If you have any questions, contact our company immediately.



warning :

Store the packaging materials out of reach of children. The handling of packaging materials must comply with local regulations or the hospital's waste disposal policies.

The device may be contaminated with microorganisms during storage, transportation, and use. Before use, please confirm that the packaging is intact, especially for single-use accessories. If damage is found, do not use it.

5.2 Environmental Requirements

The operating environment of this device must comply with the environmental specifications outlined in this manual. When transferring the device from one environment to another, temperature or humidity differences may cause condensation. The device must be left to cool down completely before use.



warning :

Ensure the equipment operates under specified environmental conditions. Failure to do so may result in non-compliance with the technical specifications stated in this manual, potentially causing equipment damage or other unforeseen consequences.

5.3 Power On

1. Before startup, inspect the pulse oximeter for mechanical damage;
2. Ensure the battery has sufficient charge;
3. Insert the blood oxygen probe into the host's USB port;
4. Press and hold the Power/Function button. The WO2 and WPO-11 models will boot into the main interface, while the WO2A and WPO-10 models will display a yellow status light (measuring mode).



warning :

If the pulse oximeter is damaged or malfunctioning, it should not be used for patient monitoring. Contact the maintenance personnel or our company immediately.

5.4 Power off

Please follow the steps below to turn off the pulse oximeter:

1. Confirm the end of patient monitoring;
2. Hold the "Power/Function Key" for approximately 2 seconds to enter the "Shut Down" menu option of the pulse oximeter. Press the "Power/Function Key" again to turn off the device. Additionally, models with a display screen will automatically shut down after approximately 1 minute if no operation or measurement is performed in the "Measurement Pending" status on the main interface or in models without a display screen.
3. Disconnect the connection between the pulse oximeter and the pulse oximeter probe.

6. Measure

6.1 Blood oxygen measurement

Connect the blood oxygen probe plug of the device to the corresponding USB blood oxygen probe socket on the main panel.

 **Note:** The following appearance diagrams of blood oxygen probes are for reference only. Please refer to the actual probe for specific details.

As shown in Figure 6.1a, insert the subject's finger (preferably the index finger) into the probe. After powering on the pulse oximeter, the measurement begins, and the data is displayed on the instrument's screen.

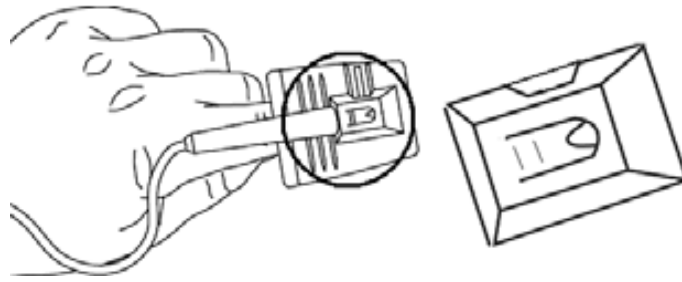


Figure 6.1a Schematic diagram of blood oxygen probe measurement on the hand



Figure 6.1b Schematic diagram of finger insertion for blood oxygen probe

Installation and removal of the wristband:

- a) Position the wristband with the magnetic buckle side facing upward (as shown in Figure 6.1c) at an appropriate location on the wrist. Pre-fix the wristband to the wrist using the self-adhesive cloth at its distal end. The other end of the wristband (with its own self-adhesive cloth) is threaded through the "Ri" buckle in the direction indicated by the arrow in Figure 6.1d, then pulled taut in the opposite direction, and finally secured firmly using the self-adhesive cloth.
- b) Finally, align the magnetic buckle on the back of the pulse oximeter with the corresponding magnetic buckle on the wristband and fasten them securely. The device should be worn as shown in Figure 6.1e.
- c) When removing the wristband, first detach and store the pulse oximeter from the wristband, then proceed with the wristband disassembly.



Figure 6.1c

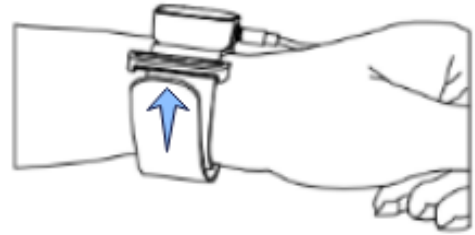


Figure 6.1d

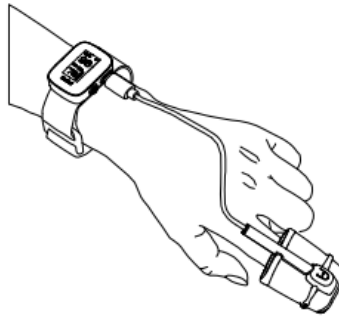


Figure 6.1e

Kindly reminder :

- a) The finger should be inserted as deeply as possible into the finger loop-type pulse oximeter probe, as shown in Figure 6.1b.
- b) Ensure the presence of arterial capillaries (generating pulsatile signals) and bones (for light scattering) in the measured tissue along the optical path between the two sides of the blood oxygen probe, enabling effective measurement of arterial oxygen saturation.
- c) If the initial reading of the instrument is significantly unreliable due to motion interference, the device may be powered off and restarted or the probe disconnected and reinserted to enable the machine to rapidly track the true blood oxygen level.
- d) After the measurement is completed, the blood oxygen probe is removed and properly stored.

e) Avoid excessive finger movement and strong ambient light during measurement.

6.2 Matters need attention

Identify situations or practices that may cause damage to equipment or other property.

-  Before use, check the blood oxygen device. If the main unit is damaged or the operating temperature is abnormal, stop using it immediately.
-  When ambient temperature exceeds 35°C, it is recommended to change the wearing position every 2 hours. If the temperature reaches 37°C, avoid using the pulse oximeter as prolonged use may cause severe burns.
-  As a general rule, check the wearing site every 1 to 2 hours to maintain optimal skin texture and proper light alignment. If skin texture changes, reposition the blood oxygen probe to another area.
-  Prolonged use of pulse oximeters may cause discomfort or tenderness, particularly in patients with microcirculatory disturbances. It is advisable to limit continuous probe placement on the same finger to no more than two hours.
-  Do not place the blood oxygen device on limbs with arterial or venous infusion lines, as this may lead to inaccurate measurement results.
-  The oxygen probe cable should be kept away from the patient's neck to prevent entanglement and potential asphyxiation. The cable must not be folded or twisted.
-  When performing non-invasive blood pressure measurement, the blood pressure

cuff must not be used on the same limb as the pulse oximeter sensor, as this may trigger system error alerts.

- 🔔 The subject's fingernails should not be painted with nail polish or other cosmetics, and the fingernails should not be excessively long.
- 🔔 Fingers should be correctly positioned, as improper placement may lead to inaccurate measurements.
- 🔔 Do not immerse the entire blood oxygen probe in water, solution, or cleaning agents, as the sensors and connectors on the probe are not waterproof.
- 🔔 The light between the blood oxygen saturation sensor and the photoelectric receiving tube must pass through the patient's small arterial bed.
- 🔔 The pulse oximeter can be reused. Prior to reuse, the device must be cleaned and disinfected. For specific procedures, refer to the cleaning and disinfection guidelines.
- 🔔 Improper use of adhesive tape to secure the pulse oximeter may result in inaccurate SpO₂ measurements.
- 🔔 Do not place light-blocking materials such as adhesive tape in the path of the probe.
- 🔔 Excessive ambient light can also interfere with measurements, including fluorescent lamps, dual ruby lamps, infrared heaters, and direct sunlight.
- 🔔 The measurement accuracy will be affected by the intense activity of the subject and the interference of the extreme electrical surgery.

7. Interface Introduction and Operation

7.1 Operating steps:

Correctly insert the pulse oximeter probe into the pulse oximeter. Press and hold the power /function key "" to power on and enter the startup screen (as shown in Figure 7.1a), then automatically switch to the monitoring screen. Correctly wear the pulse oximeter probe, and the monitoring interface will display real-time measurement values (as shown in Figure 7.1b). Short press the power/function key to rotate clockwise 90° to switch screens (as shown in Figure 7.1c).



Figure 7.1a

Figure 7.1b



Figure 7.1c

Note:WO2A/WPO-10 does not have a display screen, please refer to Chapter 14.

7.2 Menu Settings:

In the monitoring interface, long-press the Power/Function key to access the menu settings list (as shown in Figures 7.3a, b, and c). Short-press the Power/Function key to select a setting, and long-press it to confirm the selected option.

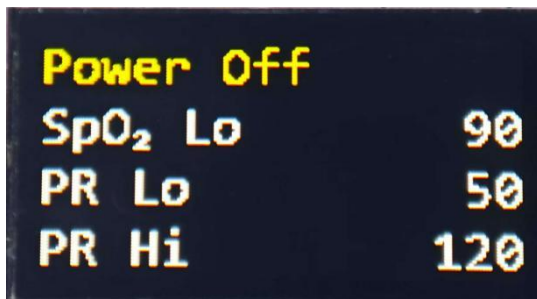


Figure 7.3a

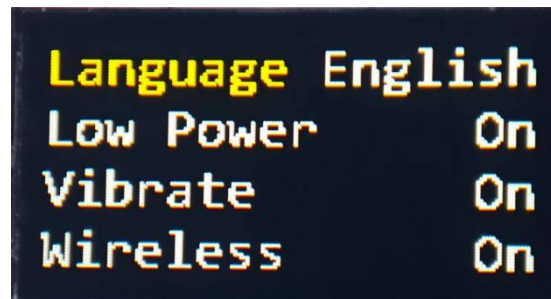


Figure 7.3b

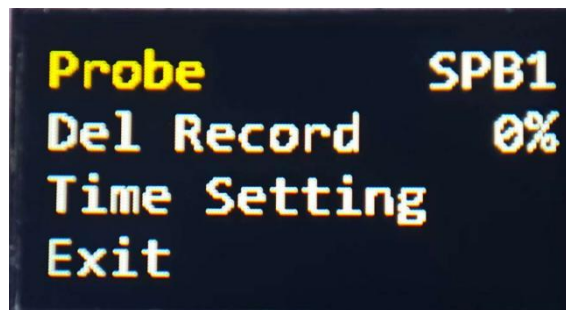


Figure 7.3c

Shut down: The default setting is 'Shut down' when entering the menu list. You can manually shut down the device by holding the Power/Function key.

Blood oxygen lower limit: Set the range from 85% to 100%, with a step size of 1 and a default value of 90%.

Pulse rate lower limit: Set the range from 30 bpm to 95 bpm, with a step size of 5 and a default of 50 bpm.

Maximum pulse rate: Set the range from 100 bpm to 250 bpm, with a step size of 5 and a default value of 120 bpm.

Language: Switch between Chinese and English display interfaces;

Power-saving mode: Once enabled, the screen will turn off 5 seconds after the measurement value is recorded. The power-saving mode will automatically exit if the button or parameter exceeds the limit or if the finger detaches.

Vibration: When enabled, the vibration function activates if parameters exceed limits. Press the power or function key briefly to pause the vibration for 90 seconds.

Wireless: After activation, upload real-time and historical data using the company's mobile oxygen saturation management software.

Time settings: System date and time settings;

Delete records: This removes stored measurement data from the device, with a confirmation prompt displayed during deletion. For extended monitoring, to ensure sufficient storage space, it is recommended to first clear earlier measurement data. Before clearing, upload the data to a computer hard drive or other storage media. The number following 'Delete records' indicates the percentage of storage space used by the device.

Exit: Exit and save your settings.

8. Technical parameter

8.1 Explanation of oxygen saturation parameters

Measurement range: 35%~100% Display range: 35%~100%

Measurement error: When the blood oxygen saturation ranges from 70% to 100%, the error is $\pm 2\%$; from 50% to 69%, the error is $\pm 3\%$; no definition is provided for values below 50%.

Discrimination rate: 1%

8.2 Pulse rate parameter description

Measurement range: 30 bpm to 250 bpm

Display range: 30 bpm to 250 bpm

Measurement accuracy: $\pm 2\%$ or ± 2 bpm, whichever is greater

Resolution: 1 bpm

8.3 The blood perfusion index indicates

Measurement range: 0.4%-20%

8.4 Resistance to ambient light interference

The blood oxygen saturation and pulse rate parameters can be measured with the error requirement published in this specification when the device is used in the environment of power frequency light source and natural light.

8.5 Exceeding limit vibration indication

When the device vibration function is activated, the pulse oximeter will emit a vibration alert if it detects that the pulse ox saturation or pulse rate exceeds the preset threshold.

8.6 Wireless transmission

Supports wireless transmission.

8.7 External dimensions of the host

Dimensions: 40mm x 30mm x 12mm

8.8 Classify

Classified by medical device management category: Class II devices.

According to the type of electric shock prevention, it is divided into: internal power supply equipment.

According to the degree of electric shock prevention, it is divided into: BF type equipment.

The protection level against harmful liquid ingress is classified as IP68.

According to electromagnetic compatibility, it is divided into: Group I Class B equipment.

Application section regarding whether the device has protection against defibrillation discharge effects: None

Classified by the disinfection and sterilization methods recommended by the manufacturer: equipment with disinfection and sterilization methods recommended by the manufacturer.

The safety level is classified according to the presence of flammable anesthetic gas in the mixture with air, or with oxygen, or with nitrous oxide: Not suitable for use in areas containing flammable anesthetic gases.

Classified by operation mode: continuous operation equipment.

8.9 Factors affecting the accuracy

a) Intravenous injection of dyes (such as methylene blue and indigo green)

b) Indoor strong light interference

c) Vascular dyes or external colorants, such as nail polish or colored skincare products

d) Intense movement in the detection area

e) Inadequate placement of the sensor, resulting in a penumbra effect

f) Hyperbaric oxygen therapy

g) Same-side blood pressure measurement

h) Peripheral vasospasm, or vasoconstriction induced by temperature reduction

8.10 Else

Sensor: Infrared red light emitting diode

Wavelength: Red light: 660nm, Infrared light: 905nm.

Maximum average optical output power: ≤ 2 mW

Update cycle for oxygen saturation and pulse rate data: <10 s

Average and update cycles for SpO₂ and pulse rate data: The SpO₂ and pulse rate (PR) values displayed on the pulse oximeter are calculated and averaged from multiple datasets collected within a specific time interval. SpO₂ values are computed using data acquired over the most recent 5 seconds, with calculations performed every second. Pulse rate values are determined by detecting each heartbeat, with one calculation per heartbeat detected. The averaging method is synchronized with pulse rate values: When pulse rate is below 50 bpm, the displayed SpO₂ value is calculated as a moving average of the most recent 16 seconds of SpO₂ data, and the displayed pulse rate value is calculated as a moving average of the most recent 4 beats of pulse rate data. When pulse rate ranges between 50 bpm and 120 bpm, the displayed SpO₂ value is calculated as a moving average of the most recent 8 seconds of SpO₂ data, and the displayed pulse rate value is calculated as a moving average of the most recent 8 beats of pulse rate data. When pulse rate exceeds 120 bpm, the displayed SpO₂ value is calculated as a moving average of the most recent 4 seconds of SpO₂ data, and the displayed pulse rate value is calculated as a moving average of the most recent 16 beats of pulse rate data. The displayed SpO₂

and pulse rate values are updated every second based on the latest calculated data.

The displayed photoelectric volume wave is a normalized waveform. When the signal is incomplete (e.g., excessive signal noise, degraded signal quality, or signal loss), the blood oxygen and pulse rate readings will become invalid values, i.e., the numerical values will disappear, and the display will show "---".

9. Attachment list

order number	Attachment name/model	quantity	configure
1	pulse oximeter	1 unit	standard configuration
2	operating instruction	1 book	standard configuration
3	data wire	1 item	standard configuration
4	Blood oxygen probe	1 item	standard configuration

10. Batteries

The device is powered by lithium batteries (model/specification: 301730 d.c. 3.7V 100mAh). The batteries are pre-installed and do not require user installation.

For WO2 and WPO-11 models, the oxygen monitor displays a charging status icon  when charging. The battery is fully charged when the charging icon stops scrolling and reaches full. In power-saving mode, the device operates for at least 12 hours on a fully charged lithium .

battery. The screen indicates the battery status as follows: a flashing red box means low battery; a: indicates approximately 25% remaining; a: indicates approximately 50% remaining; a: indicates approximately 75% remaining; and a: indicates full charge.

For the WO2A/WPO-10 model, the green status light flashes during blood oxygen meter charging; the green status light remains on continuously when the battery is fully charged; under conditions of a newly charged lithium battery with full capacity, the device operation time is no less than 13 hours. When the blood oxygen meter is in operation with low battery level, the green status light flashes.



warning :

- Keep batteries out of reach of children.
- The disposal of waste batteries should comply with relevant regulations.
- Do not immerse the battery in water, solution, or fire, or short-circuit it. Burning, explosion, or short-circuiting the battery may cause injury.
- Do not disassemble batteries.
- Users are prohibited from replacing lithium batteries without authorization. For maintenance, please contact the authorized service center promptly, where professionals will replace the batteries with the same manufacturer and model.
- Do not replace the battery without proper training, as this may cause overheating, fire, or explosion.

11. Maintenance and Care

11.1 Maintenance

The designed service life of the pulse oximeter is 5 years, and the lithium battery has a service life exceeding 500 complete charge-discharge cycles. To ensure the longevity of the device, please adhere to proper maintenance.

- a) Regularly inspect product components or appearance for obvious damage (e.g., cracked strap, abnormal screen, abnormal temperature rise, etc.). It is recommended to check the blood oxygen device at least once per week to ensure no damage that may affect instrument safety or detection performance.
- b) The operating environment should contain non-flammable substances. Do not disinfect this product under high temperature, high pressure, gas fumigation, or liquid immersion. Before cleaning and disinfection, remove the internal battery and avoid extreme temperature and humidity conditions.
- c) If the pulse oximeter is splashed with water or condensation occurs, discontinue operation.
- d) Do not operate this product with sharp objects.
- e) When the battery shows low voltage, use a power adapter to charge it promptly.

f) Instrument maintenance shall be performed exclusively by qualified personnel designated by the manufacturer. Users are prohibited from conducting repairs without authorization. The manufacturer may provide maintenance manuals, circuit diagrams, and other repair documentation to authorized personnel.

g) This product has been calibrated before leaving the factory, and users do not need to perform additional calibration during use. If calibration of the pulse oximeter is required during maintenance, the FLUKE INDEX2 series simulator may be used for verification.

11.2 Maintenance of Lithium Battery

To prolong the battery life, proper usage and maintenance are essential.

- a) If the device fails to start and the battery is suspected to be damaged, contact the manufacturer immediately for professional repair personnel to replace the battery with the same type and specifications. Users should not attempt replacement themselves.
- b) To maintain battery power and extend battery life, it is recommended to check and use the battery at least once a month.
- c) When the instrument is left unused for an extended period, it should first be charged to 50%–80% capacity and undergo periodic maintenance charging, typically every 3 months, to prevent irreversible capacity loss due to excessive self-discharge from prolonged storage.

11.3 Cleaning and Disinfection

- a) Do not immerse cleaning products in liquids.
- b) When dust or dirt appears on the surface of the instrument or probe, wristband, the user may wipe it with 75% medical alcohol. When wiping, use a dry cloth to absorb a small amount of alcohol, and avoid allowing the alcohol to drip into or enter the instrument.
- c) Use natural air drying or clean, dry cloth to clean.
- d) After each use, clean and disinfect the product (including accessories) for personal reuse or transfer to another patient.

12. Fault analysis and troubleshooting

fault phenomenon	analysis of causes	elimination method
The value cannot be displayed properly or is unstable.	Finger not inserted correctly; fingertip tremor or the body is in motion; Not used in the required working environment conditions; Product operation failed. The blood oxygen sensor is damaged.	Insert your finger correctly and try again. Try not to move; Use under normal working conditions. Contact after-sales.
No vibration notification	Vibration is not enabled. Product operation failed.	Please refer to the manual for interface introduction and operation settings. Contact after-sales.
Cannot boot	The battery is low or dead. Product operation failed.	Charge the device. Contact after-sales.
Display suddenly disappears	The product enters power-saving mode. The battery may be low. Product operation failed.	normal ; Charge the device. Contact after-sales.
The interface displays "finger detached"	The finger is not inserted; The blood oxygen sensor is damaged.	Insert fingers correctly; Contact the distributor to replace the pulse oximeter.

13. EMC guidelines

Guidelines and manufacturer's statements-electromagnetic emissions			
The pulse oximeter is intended for use in the following specified electromagnetic environments. Purchasers or users shall ensure its operation under these conditions:			
launching test	compliance	Electromagnetic Environment: A Guide	
Radio Frequency Emission GB 4824	Group 1	The pulse oximeter utilizes radiofrequency energy solely for its internal functions. Consequently, its radiofrequency emission is minimal, and the likelihood of interference with nearby electronic devices is negligible.	
Radio Frequency Emission GB 4824	B class	The pulse oximeter is suitable for use in all facilities directly connected to non-residential and residential public low-voltage power supply networks.	
Harmonic Emission GB 17625.1	not applicable		
Voltage Fluctuation/Flashing Emission GB 17625.2	not applicable		
Guidelines and manufacturer's declaration-electromagnetic immunity			
The pulse oximeter is intended for use in the following specified electromagnetic environments. Purchasers or users shall ensure its operation under these conditions:			
immunity test	IEC 60601 test level	complementary level	Electromagnetic Environment: A Guide
electrostatic discharge GB/T 17626.2	±6kV contact discharge ±8kV air discharge	±6kV contact discharge ±8kV air discharge	The floor should be made of wood, concrete, or tiles. If the floor is covered with synthetic materials, the relative humidity should be at least 30%.
electric fast transient pulse train GB/T 17626.4	±2kV power line ±1kV input/output line	not applicable	not applicable
surge GB/T 17626.5	±1kV line alignment ±2kV line to ground	not applicable	not applicable
Voltage Sags, Short-term Interruptions and Voltage Fluctuations on	<5%UT, lasting 0.5 cycles (above 95% temporary drop on UT) 40%UT, lasting 5 cycles (above 60% temporary	not applicable	not applicable

Power Supply Input Lines GB/T 17626.11	drop on UT) 70%UT, lasting 25 cycles (30% temporary drop on UT) <5%UT, lasting 5 seconds (above 95% temporary drop on UT)		
Power frequency magnetic field 50Hz/60Hz GB/T 17626.8	3A/m	3A/m	The power frequency magnetic field should exhibit the characteristic level of power frequency magnetic fields in typical commercial or hospital environments.

Note: UT denotes the AC grid voltage prior to applying the test voltage.

Guidelines and manufacturer's declaration-electromagnetic immunity

The pulse oximeter is intended for use in the following specified electromagnetic environments. Purchasers or users shall ensure its operation under these conditions:

immunity test	IEC 60601 test level	accord with electrical level	electromagnetic environment guide
radio frequency conduction GB/T 17626.6	3V (effective value) 150kHz ~ 80MHz	3V (effective value) 3V/m	Portable and mobile radio frequency communication devices should not be used closer than the recommended isolation distance from any part of the pulse oximeter, including the cable. The distance should be calculated using a formula corresponding to the transmitter frequency. Recommended isolation distance $d=1.2\sqrt{P}\sqrt{P}$ $d=1.2\ 80\text{MHz}\sqrt{P} \sim 800\text{MHz}\sqrt{P}$ $d=2.3\ 800\text{MHz}\sqrt{P} \sim 2.5\text{GHz}$, where: $\sqrt{P}$
radio-frequency radiation GB/T 17626.3	3V/m 80MHz ~ 2.5GHz		P — the maximum rated output power of the transmitter, provided by the manufacturer, measured in watts (W). d-Recommended isolation distance, in meters (m). The field strength of the fixed RF transmitter is determined by surveying the electromagnetic field, and it should be lower than the compliance level in each frequency range.  Interference may occur near the device with the symbol on the right side of the logo.

Note 1: For frequencies of 80MHz and 800MHz, the formula for the higher frequency band shall be applied.

Note 2: These guidelines may not be suitable for all cases, as electromagnetic propagation is affected by the absorption and reflection of buildings, objects, and the human body.

- a: The field strength of fixed transmitters—including wireless (cellular/wireless) telephones, ground-based mobile radio base stations, amateur radio, AM/FM radio broadcasting, and television broadcasting—cannot be precisely predicted theoretically. To evaluate the electromagnetic environment of fixed RF transmitters, electromagnetic field surveys should be conducted. If the measured field strength at the pulse oximeter location exceeds the applicable RF compliance level, the pulse oximeter should be observed to verify its normal operation. If abnormal performance is detected, corrective measures may be necessary, such as repositioning or recalibrating the pulse oximeter.
- b: The field strength should be below 3V/m across the entire frequency range from 150kHz to 80MHz.

Recommended Isolation Distance Between Portable and Mobile RF Communication Devices and Pulse			
The pulse oximeter is intended for use in an electromagnetic environment where radio frequency radiation interference is controlled. Based on the maximum rated output power of the communication device, purchasers or users may prevent electromagnetic interference by maintaining the minimum recommended distance between portable and mobile radio frequency communication devices (transmitters) and the pulse oximeter.			
Maximum rated output power of transmitter /W	Isolation distance per meter for different transmitter frequencies		
	150 kHz ~ 80 MHz $d = 1.2\sqrt{P}$	80 MHz ~ 800 MHz $d = 1.2\sqrt{P}$	800 MHz ~ 2.5 GHz $d = 2.3\sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23
For transmitter rated maximum output power not listed in the table above, the recommended isolation distance d (in meters) can be determined using the formula in the corresponding transmitter frequency column. Here, P is the transmitter's maximum rated output power (in watts) provided by the manufacturer.			
Note 1: For the 80 MHz and 800 MHz frequency points, the formula for the higher frequency range is applied.			
Note 2: These guidelines may not be suitable for all situations, as electromagnetic propagation is affected by absorption and reflection by buildings, objects and the human body.			

14. APP download and installation guide

Use your smartphone camera to scan the QR code below to quickly access our official app.



A) iOS users: After scanning the code, the system will automatically jump to the application page in Apple App Store. Please click the "Get" button to download and install the application. After installation, you can find the application icon on the desktop of your mobile phone and open it to use.

b) Android users: After scanning the QR code, your mobile browser will automatically start downloading the APK installation package of this app. Once the download is complete, click on the notification in the notification bar to confirm the download. When installing an app from an unofficial store for the first time, the system may display a security warning stating "The installation of apps from this source has been blocked." To proceed, click on "Settings" or "More," find and enable the permissions for "Apps from this source" or "Install unknown apps," and follow the on-screen instructions to complete the installation. Once installed, you can find the app icon on your phone's home screen and open it to use.