

**User Manual**

**Wrist Oximeter**

**Model: PC-68A**

**Brand: Boston Life Labs**

## **Instructions to User**

OW1.0 Wrist Oximeter is a precision measuring device, please read the manual very carefully before using this device. Failure to follow these instructions may cause measuring abnormality or device damage.

The Manual is published in English and Boston Life Labs LLC. has the ultimate right to explain the Manual. No part of this manual may be photocopied, reproduced or translated into another language without the prior written consent. Boston Life Labs LLC. reserves the right to improve and amend it at any time without prior notice.

Version of This Manual: Ver 1.0

All rights reserved.



### Notes

- The contents contained in this manual are subject to change without prior notice.
- Information furnished by Boston Life Labs is believed to be accurate and reliable. However, no responsibility is assumed by us for its use, or any infringements of patents or other rights of third parties that may result from its use.

### Instructions for Safe Operations

- Check the device to make sure that there is no visible damage that may affect user's safety or measurement performance with regard to sensors and clips. It is recommended that the device should be inspected minimally once a week. When there is obvious damage, stop using the device.
- Necessary maintenance must be performed only by qualified service technicians. Users are not permitted to maintain it by themselves.
- The oximeter cannot be used together with devices not specified in User Manual.

### Cautions

- Explosive hazard—**DO NOT** use the oximeter in environment with inflammable gas such as some

ignitable anesthetic agents.

- **DO NOT** use the oximeter while the testee is under MRI or CT scanning.

### Warnings

- An uncomfortable or painful feeling may appear if using the oximeter continuously on the same place for a long time, especially for poor microcirculation patients. It is recommended that the oximeter should not be applied to the same location for longer than 2 hours. If any abnormal condition is found, please change the position of oximeter.
- DO NOT clip this device on edema or tender tissue.
- The light (the infrared light is invisible) emitted from the device is harmful to the eyes, so service technician or testee should not stare at the light.
- The local law must be followed when disposing of the device.

### Attentions

- ⚠ Keep the oximeter away from dust, vibration, corrosive substances, explosive materials, high temperature and moisture.
- ⚠ The device should be kept out of the reach of children.

- ⚠ If the oximeter gets wet, please stop using it and do not resume operation until it is dry. When it is carried from a cold environment to a warm and humid environment, please do not use it immediately.
- ⚠ **DO NOT** operate the button on the front panel with sharp materials.
- ⚠ High temperature or high pressure steam disinfection to the oximeter is not permitted. Refer to related chapter for instructions of cleaning and disinfection.

---

**Table of Contents**

<b>1 OVERVIEW .....</b>	<b>1</b>
<b>1.1 Appearance .....</b>	<b>1</b>
<b>1.2 Name and Model .....</b>	<b>2</b>
<b>1.3 Conformation .....</b>	<b>3</b>
<b>1.4 Features .....</b>	<b>3</b>
<b>1.5 Intended Use .....</b>	<b>4</b>
<b>1.6 Key of Symbols .....</b>	<b>4</b>
<b>2 BATTERY INSTALLATION.....</b>	<b>5</b>
<b>3 OPERATION.....</b>	<b>6</b>
<b>3.1 Measuring Operation.....</b>	<b>6</b>
<b>3.2 Alarm Limit Settings .....</b>	<b>11</b>
<b>3.3 Upload Data .....</b>	<b>14</b>
<b>3.4 Low Battery Indication .....</b>	<b>15</b>
<b>4 ADDITIONAL ADVICE FOR OPERATION.....</b>	<b>16</b>
<b>5 TECHNICAL SPECIFICATIONS.....</b>	<b>17</b>
<b>6 ACCESSORIES.....</b>	<b>19</b>
<b>7 REPAIR AND MAINTENANCE .....</b>	<b>19</b>
<b>7.1 Maintenance .....</b>	<b>19</b>
<b>7.2 Cleaning and Disinfecting Instruction .....</b>	<b>20</b>
<b>8 TROUBLESHOOTING .....</b>	<b>21</b>
<b>9 APPENDIX .....</b>	<b>22</b>
<b>Common Knowledge for SpO<sub>2</sub> Measurement .....</b>	<b>22</b>
<b>B Wristband Installation and Disassembly .....</b>	<b>25</b>

# 1 Overview



## 1.1 Appearance



Figure 1 Front View

1. **LCD screen**
2. **Set key:** shift display modes, confirm the operation etc.
3. **Scroll key:** move display cursor, modify parameter values etc.



Figure 2 Frontal Side View

**4. Buzzer**

**5. Data interface**

**6. Wristband Underlay**

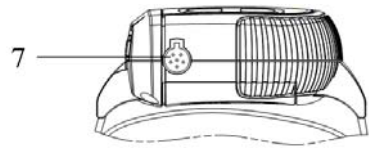


Figure 3 Right Side View

**7. SpO<sub>2</sub> probe receptacle**

## **1.2 Name and Model**

**Name:** Wrist Oximeter

**Model:** OW1.0



### 1.3 Conformation

It comprises the main unit and SpO<sub>2</sub> probe.

### 1.4 Features







Wrist Oximeter can be used to monitor pulse oxygen saturation (SpO<sub>2</sub>) and pulse rate accurately. Simply put your finger into sensor, SpO<sub>2</sub> value and pulse rate value will be displayed on screen and stored in the device.

- It is lightweight, small in size and easy to carry;
- Segment LCD display;
- Automatic starts to measure SpO<sub>2</sub> and Pulse Rate(PR) and display pulse intensity bar graph as well;
- Numerical value flash alarm function;
- Data storage and transmission to PC for viewing and analysis;
- Smart battery power management with low battery indication;
- Two AAA batteries can be used for over 50 hours' monitoring continuously.

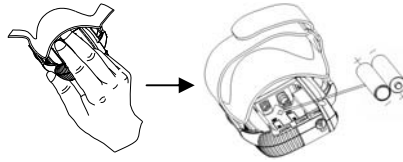
## 1.5 Intended Use

The Wrist Oximeter is intended to use in hospital, other medical community and at home. It is available and convenient for you to monitor SpO<sub>2</sub> in long-term while sleeping or at other daily activity simultaneously.

## 1.6 Key of Symbols

Symbols	Descriptions
	With Type BF applied part
	Warning — See User Manual
%SpO <sub>2</sub>	Pulse Oxygen Saturation
 BPM	Pulse rate icon(Unit: beats per minute)
	Low battery voltage
	Memory full.
SN	Serial number
	Separate collection for this device.

## 2 Battery Installation



**Figure 4 Battery Installation**

1. Lift up the cloth covered on the battery cover. Then, use your index finger and middle finger to press against the battery cover. Meanwhile, slide it towards the side with SpO<sub>2</sub> probe (as shown in Figure 4).
2. Refer to Figure 4, insert two AAA size batteries into the battery compartment properly in the right direction.
3. Replace the cover.

**Remark:**

After finishing battery installation, the oximeter will automatically power on and display software version number firstly.

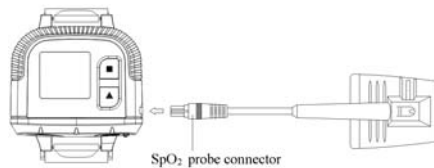
In order to record data in real time in future, please set the date/time in the oximeter via PC software-“Oximeter Data Manager”.

⚠ Please take care when you insert the batteries, as the improper insertion may make the device not work.

### 3 Operation

#### 3.1 Measuring Operation

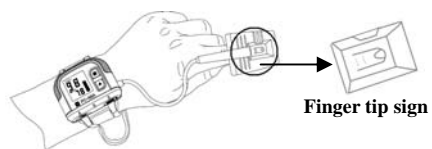
1. Insert the external SpO<sub>2</sub> probe connector into SpO<sub>2</sub> probe receptacle properly.



**Figure 5 SpO<sub>2</sub> Probe Connection**

2. Fix the oximeter on your left wrist as shown in Figure 6 (Refer to Appendix for details);

3. Then, hold the probe with its opening towards your index finger. The probe should be oriented in such a way that the sensor side with a finger tip sign is positioned on the top (Figure 6).

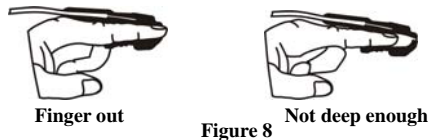


**Figure 6 Placement Demonstration**

3. Next, insert your index finger into the probe until the fingernail tip rests against the stop at the end of the probe (Figure 7). Adjust the finger to be placed evenly on the middle base of the sensor (make sure the finger is in the right position). If the index finger cannot be positioned correctly, or is not available, other finger can be used.



**Figure 7**

**Wrong Placement of the Probe:**

4. The oximeter will automatically start measurement in 2 seconds. Then the default screen will be displayed (Figure 9). User can read the values from the display screen.



**Figure 9 Default Screen**

- ◇ “%SpO<sub>2</sub>”: SpO<sub>2</sub> icon; “98”: SpO<sub>2</sub> value;
- ◇ “♥ BPM”: Pulse rate icon; “BPM”: pulse rate unit, beats per minute; “78”: Pulse rate value;
- ◇ “█”: Pulse intensity bar graph.

**Key Operations:**

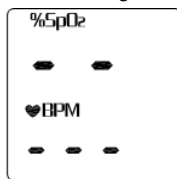
- Longtime press “■” key: alarm limit setting screen

will be displayed, refer to section 3.2 for details;

- Longtime press “▲” key: turn on/off LCD display;

#### 5. Prompt Information

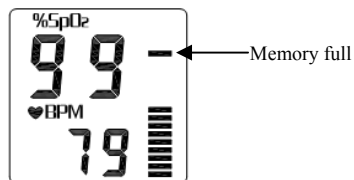
During monitoring, if there is no signal to be detected, the short lines will be prompted on the screen instead of the numerical values, as shown in Figure 10.



**Figure 10 No Signal**

During measuring, the measured values are recorded every 2 seconds. The length of data record is limited to 30 seconds at least, and the maximal length for one record is also limited to 2 hours.

During measuring, if the memory is full or the total number of the records is 256 pieces, the earliest records will be overwritten and the icon “■” will appear on the screen for prompt, as shown in Figure 11.



**Figure 11 Memory Full**

**Note:** It is suggested that the data shall be uploaded to computer for saving, or the earliest records will be overwritten.

#### 6. Working Mode

- The measurement will start automatically when the finger is inserted into the soft rubber of the sensor, so the data recording (SpO<sub>2</sub> and PR values) starts simultaneously as well. The display is as shown in Figure 9.
- During measuring, long time press“▲” key to blank the screen (the measurement and data recording are still undergoing.), but long time pressing any key will activate the display for viewing the current



measuring information again.

- If there is no signal to be detected (e.g. finger off) for 20 seconds, the device will be at idle state (i.e. blank screen and standby for measurement).
- When the device is at idle state, long time pressing any key will activate the LCD display, or once the finger is inserted in the soft rubber of the sensor, the measurement will start and LCD display will be activated as well.

### 3.2 Alarm Limit Settings

#### 3.2.1 SpO<sub>2</sub> Lower Alarm Limit Setting

On default display screen(Figure 9), longtime press “■” key to enter SpO<sub>2</sub> Lower Limit Setting Screen, as shown in Figure 12A.



Figure 12A

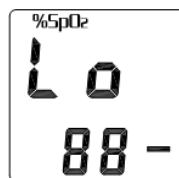


Figure 12B

- ◇ “%SpO<sub>2</sub> Lo”: SpO<sub>2</sub> lower alarm limit; “90”: SpO<sub>2</sub> preset value;
- ◇ “■”: selecting cursor;

**Key Operations:**

- On SpO<sub>2</sub> Lower Limit Setting screen (Figure 12A), press “■” key to move cursor to SpO<sub>2</sub> value (Figure 12B).
- Then press “▲” key to change its value;  
Short time press “▲” key: increase the numerical value single time;  
Long time press “▲” key: increase the numerical value continuously;
- Next, long time press “■” key to confirm the preset value and exit the setting.

**3.2.2 PR Lower and Higher Alarm Limit Settings**

On SpO<sub>2</sub> Lower Limit Setting Screen (Figure 10A), when the cursor stays in the upper area, short time press “▲” key to shift the screen among PR Lower Limit Setting screen (Figure 11A), PR Higher Limit Setting screen (Figure 12A) and SpO<sub>2</sub> Lower Limit Setting screen (Figure 10A).



Figure 11A





Figure 11B



Figure 12A



Figure 12B

- ◇ “Lo BPM”: PR lower alarm limit; “60”: preset value;
- ◇ “Hi BPM”: PR higher alarm limit; “120”: preset value;
- ◇ “-”: selecting cursor;
- ◇

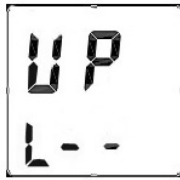
**Key Operations:**

- Short time press “■” key: move the cursor upwards or downwards;
- Short time press “▲” key: increase the numerical value single time;
- Long time press “▲” key: increase the numerical value continuously;
- Long time press “■” key: confirm the preset value and exit the setting.

**Note:** During measuring if SpO<sub>2</sub> or/and PR values exceed the preset alarm limit, the numerical value exceeded limit will flash.


**3.3 Upload Data**

Before uploading the data to PC, please quit from the menu screen if you are doing the setup. When start uploading, connect the data cable between the device and PC, then do the following operation by the instruction in “Oximeter Data Manager User Manual”, the data uploading will be activated. If the device and the PC realize communication successfully, the oximeter will display the screen as shown in Figure 13.



**Figure 13 Data Upload**

### **3.4 Low Battery Indication**

When “” occurs on the screen, it indicates battery power is not enough. If you keep on using, the measuring error may be caused, please change batteries in time.

## **4 Additional Advice for Operation**

- The finger should be put in properly and correctly.
- Avoid shaking finger as possible as you can during measuring;
- Do not put wet finger directly into sensor.
- Avoid placing the device on the same limb which is wrapped with a cuff for blood pressure measurement or during venous infusion.
- Do not let anything block the emitting light from device.
- Electrosurgical device interference may affect the measuring accuracy.
- Using enamel or other makeup on the nail may affect the measuring accuracy.

---

## 5 Technical Specifications

- A. Display mode:** Segment LCD Screen
- B. Power supply requirement:**  
1.5V (AAA size) alkaline battery × 2  
Supply voltage: 2.2 V~3.3V
- C. Operating current:** ≤40mA
- D. SpO<sub>2</sub> Parameter Specifications**  
Measuring range: 35%~99%  
Accuracy: 70%~75% ±3digits,  
75%~99% ±2digits
- E. Pulse Rate Parameter Specifications**  
Measuring range: 30bpm~240bpm  
Accuracy: ±2bpm or ±2% (whichever is greater)
- F. Preset alarm limits:**  
SpO<sub>2</sub> alarm: Lower limit: 90%  
Pulse Rate alarm: Upper limit: 120bpm  
Lower limit: 50bpm
- G. Record Interval**  
2 seconds per group (SpO<sub>2</sub> and PR values)
- H. Performance under low perfusion condition**  
The measurement accuracy still keeps the above
-

specification while the perfusion index is as low as 0.6%.

**I. Resistance to interference of surrounding light:**

The difference between the SpO<sub>2</sub> value measured in the condition of indoor natural light and that of darkroom is less than ±1%.

**J. Resistance to 50Hz /60Hz interference**

SpO<sub>2</sub> and PR are precise which have been tested by BIO-TEK pulse oximeter simulator.

**K. Physical feature**

**Dimensions:** W 59mm×D 49mm×H 22mm

**Net Weight:** about 60g (not including batteries)

**L. Classification**

**The type of protection against electric shock:**  
Internally powered equipment.

**The degree of protection against electric shock:**  
Type BF applied part.

**The degree of protection against harmful ingress of liquids:** Ordinary equipment without protection against ingress of water.

**Electro-Magnetic Compatibility:** Group I, Class B



## 6 Accessories

- A data cable (optional)
- Oximeter Data Manager software (optional)
- A wristband
- A SpO<sub>2</sub> probe
- Two batteries (AAA)
- A User Manual
- Quality Certificate

**Note:** The accessories are subject to change. See the Packing List for detailed items and quantity.

## 7 Repair and Maintenance

### 7.1 Maintenance

The life of this device is 5 years. In order to ensure its long service life, please pay attention to the use of maintenance.

- Please change the batteries when the low-voltage indicator lightens.
- Please clean the surface of the device before using. Use cloth with alcohol to wipe the device first, and

then let it dry in air or wipe it dry.

- Please take out the batteries if the oximeter will not be used for a long time.
- The best storage environment of the device is -20°C to 70°C ambient temperature and 10%~95% relative humidity.

**⚠ High-pressure sterilization cannot be used on the device.**

**⚠ Do not immerse the device in liquid.**

## **7.2 Cleaning and Disinfecting Instruction**

- Surface-clean sensor with a soft gauze by saturating with a solution such as 75% isopropyl alcohol, if low-level disinfection is required, use a 1:10 bleach solution. Then surface-clean with a damp cloth and dry with a piece of cloth.
- Clean the wristband with soapy water. Please detach the wristband from the oximeter firstly.

## 8 Troubleshooting

Trouble	Possible Reason	Solution
<b>The SpO<sub>2</sub> and Pulse Rate display instable</b>	1. The finger is not placed inside enough.	1. Place the finger properly and try again.
<b>Can not turn on the device</b>	1. The batteries are drained or almost drained. 2. The batteries are not inserted properly. 3. The device's malfunction.	1. Change batteries. 2. Reinstall batteries. 3. Please contact the local service center.
<b>Always display "No Signal"</b>	1. The probe is not connected to the oximeter properly. 2. The finger is not placed well. 3. The probe connector or the probe sensor is broken.	1. Connect the probe to the oximeter properly and try again.; 2. Place the finger properly and try again. 3. Please contact the local service center.

---

## 9 Appendix

### Common Knowledge for SpO<sub>2</sub> Measurement

#### 1 Meaning of SpO<sub>2</sub>

SpO<sub>2</sub> is the saturation percentage of oxygen in the blood, so called O<sub>2</sub> concentration in the blood; it is defined by the percentage of oxyhemoglobin (HbO<sub>2</sub>) in the total hemoglobin of the arterial blood. SpO<sub>2</sub> is an important physiological parameter to reflect the respiration function; it is calculated by the following method:

$$\text{SpO}_2 = \text{HbO}_2 / (\text{HbO}_2 + \text{Hb}) \times 100\%$$

HbO<sub>2</sub> are the oxyhemoglobins (oxygenized hemoglobin), Hb are those hemoglobins which release oxygen.

#### 2 Principle of Measurement

Based on Lamber-Beer law, the light absorbance of a given substance is directly proportional with its density or concentration. When the light with certain wavelength emits on human tissue, the measured intensity of light after absorption, reflecting and attenuation in tissue can reflect the structure character of the tissue by which the light passes. Due to that HbO<sub>2</sub> and Hb have different absorption

---

character in the spectrum range from red to infrared light (600nm~1000nm wavelength), by using these characteristics, SpO<sub>2</sub> can be determined.

**Clinical application of pulse oximeters:** SpO<sub>2</sub> is an important physiological parameter to reflect the respiration and ventilation function, so SpO<sub>2</sub> monitoring used in treatment has become more popular. (For example, such as monitoring patients with serious respiratory disease, patients under anesthesia during operation and premature and neonatal infants) The status of SpO<sub>2</sub> can be determined in timely manner by measurement and will allow finding the hypoxemia patient earlier, thereby preventing or reducing accidental death caused by hypoxia effectively.

**3 Factors affecting SpO<sub>2</sub> measuring accuracy (interference reason)**

- ✧ Intravascular dyes such as indocyanine green or methylene blue
- ✧ Exposure to excessive illumination, such as surgical lamps, bilirubin lamps, fluorescent lights, infrared heating lamps, or direct sunlight.
- ✧ Vascular dyes or external used color-up product such as nail enamel or color skin care

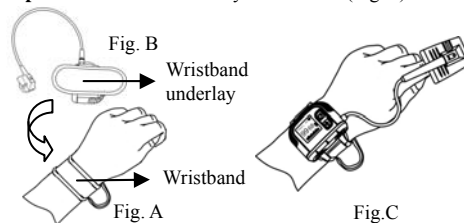
- ◇ Excessive patient movement
- ◇ Placement of a sensor on an extremity with a blood pressure cuff, arterial catheter, or intravascular line
- ◇ Exposure to the chamber with High pressure oxygen
- ◇ There is an arterial occlusion proximal to the sensor
- ◇ Blood vessel contraction caused by peripheral vessel hyperkinesias or body temperature decreasing

**4 Factors causing low SpO<sub>2</sub> Measuring value (pathology reason)**

- ◇ Hypoxemia disease, functional lack of HbO<sub>2</sub>
- ◇ Pigmentation or abnormal oxyhemoglobin level
- ◇ Abnormal oxyhemoglobin variation
- ◇ Methemoglobin disease
- ◇ Sulfhemoglobinemia or arterial occlusion exists near sensor
- ◇ Obvious venous pulsations
- ◇ Peripheral arterial pulsation becomes weak
- ◇ Peripheral blood supply is not enough

## B Wristband Installation and Disassembly

**Step 1:** Fix the wristband on your left wrist(Fig.A).



**Step 2:** Put the oximeter on the appropriate site of the wristband. Then press the oximeter to make the wristband underlay(Fig.B) stick to the wristband firmly. Next, follow the Fig.C to fix the oximeter well.

**Step 3:** The process of wristband disassembly is similar to the installation method, but with reverse procedure.

---

**⚠ Note: Please detach the wristband from the oximeter before cleaning the wristband.**

---

**FCC ID: YTKPC-68A**

**IMPORTANT REGULATORY INFORMATION**

**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 and**
- 2. This device must accept any interference that is received, including any interference that may cause undesired operation.**

**WARNING: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipments.**

**FCC Part 15.105b statement**

**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.