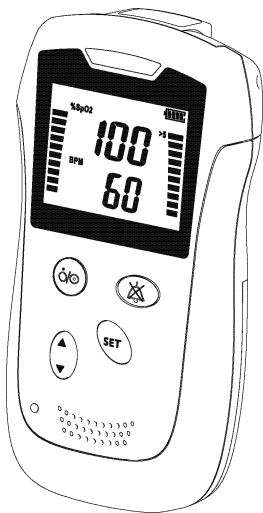


OPERATOR'S MANUAL

Concord Handheld Pulse Oximeter 75023



Concord Health Supply, Inc.

PRODUCT INFORMATION

Product Name: Concord Handheld Pulse Oximeter

Product Model: 75023

Manufacturer: Concord Health Supply, Inc.

Address: 9052 Terminal Ave Skokie IL 60077

Tel: 1-888-970-2999

Website: www.ConcordHealthSupply.com

REVISION HISTORY

This manual has a revision number. This revision number changes whenever the manual is updated due to software or technical specification change. Contents of this manual are subject to change without prior notice.

- Revision number: 1.0
- Release date: Dec. 2019

PREFACE

MANUAL PURPOSE

This manual contains the instructions necessary to operate the product safely and in accordance with its function and intended use.

Observance of this manual is a prerequisite for proper product performance and correct operation and ensures patient and operator safety.

This manual is an integral part of the product. It should always be kept close to the equipment so that it can be obtained conveniently when needed.

INTENDED AUDIENCE

This manual is intended for users in a sports or aviation setting. This manual is not intended for medical professionals as this is not a medical device.

ILLUSTRATIONS

All illustrations in this manual serve as examples only. They may not necessarily reflect the setup or data displayed on your pulse oximeter.

CONVENTIONS

- ***Italic*** text is used in this manual to quote the referenced chapters or sections.
- [] is used to enclose screen texts.
- → is used to indicate operational procedures.

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1 Safety Information




WARNING















	WARNING: Explosion hazard. Do not use the 75023 in the presence of flammable anesthetics mixture with air, oxygen, or nitrous oxide.
	WARNING: Chemicals from a broken LCD display panel are toxic when ingested. Use caution when the 75023 has a broken display panel.
	WARNING: Pulse oximetry measurements and pulse signals can be affected by certain environmental conditions, SPO2 sensor application errors, and certain patient conditions. See the appropriate sections of this manual for specific safety information.
	WARNING: The use of accessories, sensors, and cables other than those specified may result in increased emission and/or create invalid readings of the 75023.
	WARNING: Failure to cover the sensor site with opaque material in high ambient light conditions may result in inaccurate measurements.
	WARNING: Do not silence the audible alarm function or decrease the audible alarm volume if patient safety could be compromised.
	WARNING: Dispose of batteries in accordance with local ordinances and regulations.
	WARNING: To ensure user safety, do not place the 75023 in any position that might cause it to fall on the user.
	WARNING: As with all similar equipment, carefully route patient cables to reduce the possibility of patient entanglement or strangulation.
	WARNING: Ensure that the speaker is clear of any obstruction and that the speaker holes are not covered. Failure to do so could result in an inaudible alarm tone.
	WARNING: Disconnect the 75023 and SPO2 sensor from the patient throughout magnetic resonance imaging (MRI) scanning. Induced current could potentially cause burns.
	WARNING: To ensure accurate performance and prevent device failure, do not subject the 75023 to extreme moisture, such as direct exposure to rain. Such exposure may cause inaccurate performance or device failure.
	WARNING: Do not use an 75023, SPO2 sensor, or cables that appear damaged.
	WARNING: Do not lift the 75023 by the sensor or extension cable because the cable could disconnect from the 75023 and the 75023 may drop on the user.

	WARNING: The 75023 is not defibrillator-proof. However, it may remain attached to the patient throughout defibrillation or while an electrosurgical unit is in use, but the measurements may be inaccurate throughout the defibrillation and shortly thereafter.
	WARNING: Use only the spo2 sensor and extension cable supplied by Concord. Do not connect any device other than a Concord-approved SPO2 sensor to the sensor connector.
	WARNING: The 75023 should not be used adjacent to or stacked with other equipment. If adjacent or stacked use is necessary, the 75023 should be observed to verify normal operation using the configuration in which it is to be used.
	The medical electrical equipment needs to be installed and put into service according to EMC Information.
	Portable and mobile RF communications equipment can affect medical electrical equipment, refer to the recommended separation distances provided in EMC Information.
	The use of patient cable and other accessories not supplied by the manufacturer may result in increased emissions or decreased immunity of the equipment.
	The equipment should not be used adjacent to or stacked with other equipment, refer to the recommended separation distances provided in EMC Information.

**CAUTION**

	Caution: All combinations of equipment must be in compliance with IEC Standard 60601-1-1 systems requirements.
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2 Symbols

	Direct Current (DC)
	Attention: Consult accompanying documents (this manual).
	Auxiliary output connector
	Power supply connector
	Alarm silence button
SET	Setting button
	Power button
	Up button
	Down button
	Date of manufacture
[SN]	Serial number
	Safety Class II equipment
	Type BF applied part, defibrillation protected
IPX1	Resistant to liquid ingress
EC REP	European community representative
	The following definition of the WEEE label applies to EU member states only. This symbol indicates that this product should not be treated as household waste.
	Caution&warning
	Non-sterilization

3 Introduction

3.1 Working Principle

The Pulse Oximeter works by applying a sensor to a pulsating arteriolar vascular bed. The sensor contains a dual light source and photo detector. Skin, bone, tissue, and venous normally absorb a constant amount of light during systole and diastole, as blood volume increases and decreases. The ratio of light absorbed at systole and diastole is translated into an oxygen saturation measurement. This measurement is referred to as SpO₂.

3.2 Intended Use

The pulse oximeter is indicated for continuous or spot check monitoring of functional arterial oxygen saturation (SpO₂) and pulse rate of adult and pediatric users in a sport and aviation setting.



WARNING: Do not make any clinical judgments based solely on the 75023. The 75023 is intended only as an adjunct in patient assessment. It must be used in conjunction with clinical signs and symptoms.

3.3 Package Contents

Quantity	Item
1	75023 pulse oximeter
3	Alkaline "AA" size, 1.5-volt batteries
1	SPO ₂ sensor
1	Protective cover
1	User manual

1

1

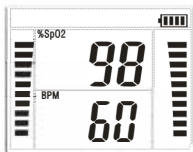
4 Battery Installation

4.1 Battery Power

The pulse oximeter is designed to operate on three 1.5V alkaline AA batteries. A new set of batteries will provide at least 22 hours of operation.

4.2 Low Battery Indicator

The Low Battery indicator displays and flashes on the information area, and a low priority alarm begins to sound when approximately 15 minutes of operation remains. The batteries should be replaced at this point.



Caution: If the 75023 is to be stored for a period of three months or longer, remove the batteries from the device before storage.

4.3 Installing the Batteries




- 1) Turn off power. Pull the battery cover downward, toward the bottom of the 75023, and then remove the battery access door.
- 2) Install three "AA" size batteries, orientated as shown in Figure 1.
- 3) Replace the battery access door.



WARNING: Dispose of battery in accordance with local ordinances and regulations.



WARNING: Explosion hazard. Do not use the 75023 in the presence of flammable anesthetics mixed with air, oxygen, or nitrous oxide.

	WARNING: To ensure user safety, do not place the 75023 in any position that might cause it to fall on the user.
	WARNING: As with all medical equipment, carefully route patient cables to reduce the possibility of patient entanglement or strangulation.
	WARNING: To ensure accurate performance and prevent device failure, do not expose the 75023 to extreme moisture such as rain.

5 75023 Operation

5.1 Introduction

The parameters of the 75023 are preset to factory default values. See Table 2. Table 2 lists the parameters, ranges available, and the factory default values. The parameter may be set on an individual basis by the user, and will remain in effect until the default parameters are restored. (See section 5.3.5)

Table 2: Parameter Ranges

Parameter	Range/selections	Factory defaults
%SpO2 Upper Alarm Limit	Lower Alarm Limit plus 1 to 100%	100%
%SpO2 Lower Alarm Limit	20% to Upper Alarm Limit minus 1	90%
Pulse Rate Upper Alarm Limit	Lower Alarm Limit plus 1 to 250 bpm	90 bpm
Pulse Rate Lower Alarm Limit	30 bpm to Upper Alarm Limit minus 1	40bpm
User type	ADU(adult) PED(pediatric) NEO (neonate)	Adult
Alarm Volume	1 to 10	5
Pulse Beep Volume	0 to 10	5
Shelf life	5 Years	

5.2 Turn On The 75023

- 1) Press the Power button to turn on the 75023.
- 2) The notice lamp flashes, and then goes out.
- 3) The system gives a beep and displays the startup screen.
- 4) The startup screen disappears and the pulse oximeter enters the main screen.

5.3 Set up the 75023

To access the following parameters below, press the set button until the parameter you want to adjust is displayed.

When you have completed adjusting the parameters, press and release the power button once, to save your parameters and return to the main screen. Please note that if you do not press the power button at the conclusion of this process, your parameters will not be saved.

5.3.1 Adjust Pulse Beep Volume

1) Press button **[SET]→[VOL]** and press **Up/Down** button to increase or decrease the pulse beep volume, then set the volume between 0 and 10.

Note: When the pulse beep volume display is shown, the user is able to adjust the volume of the pulse beep tone. Each activation of an Up or Down button increases or decreases the pulse beep volume and increments or decrements by one the number of segments shown on the Pulse Amplitude (blip) bar as a relative indicator of the current volume. The minimum pulse rate volume is none or OFF (no blip bar segments shown), the maximum pulse rate volume is ten (ten segments). Attempted adjustments outside the range generate an invalid key tone.

2) Press power button for 1 second, the menu screen can quickly return to normal operation display.

5.3.2 Select User Type



WARNING: Be sure to select correct user category setting for your user before measurement. Wrong user category may result in user hazard due to pulse rate alarm limits.

1) Press button **[SET]→[PA]** and Press the Up/Down button, select user type value: ADU(adult), PED(pediatric), NEO(neonate).



2) Press the power button for 1 second, the menu screen can quickly return to normal operation display.

5.3.3 Set Alarm Limit

5.3.3.1 PR High/Low Alarm Limit

Press button **[SET]→[BPM H]** or **[BPM L]** and press the Up/Down button, set the PR value between 30 and 250.

Note: The pulse rate alarm limit range is 25 to 250. The upper value of the

pulse rate low alarm limit is limited one number lower than the pulse rate upper alarm limit. The pulse rate low alarm limit cannot be set equal to or higher than the pulse rate upper alarm limit. In the same way, the pulse rate upper alarm limit cannot be equal to or lower than the pulse rate low alarm limit.

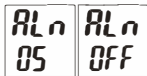
5.3.3.2 Set SPO2 Low Alarm Limit

Press button **[SET]**→**[SPO2 L]** and Press the Up/Down button, set the SPO2 value between 20 and 100.

Note: The %SpO2 alarm limit range is 20% to 100%. The upper value of the %SpO2 low alarm limit is limited to the %SpO2 upper alarm limit. The %SpO2 low alarm limit cannot be set equal to or higher than the %SpO2 upper alarm limit. In the same way, the lower value of the %SpO2 upper alarm limit is limited to the %SpO2 low alarm limit. The %SpO2 upper alarm limit cannot be set equal to or lower than the %SpO2 low alarm limit.

5.3.3.3 Switch ON/OFF Alarm Volume

Select **[SET]**→**[ALn]**, and press the Up/Down button, to change the alarm volume. The lowest value is "Off". The highest value is 10.



	WARNING: When the alarm sound is switched off, the pulse oximeter will give no audible notice tones even if a new notice occurs. Therefore the user should be very careful about whether to switch off the notice sound or not.
	WARNING: Do not rely exclusively on the audible notice system for user monitoring. Adjusting alarm volume to a low level may result in a hazard to the user. Always keep the user under close surveillance.

5.3.3.4 Alarm Silencing

Press the key for 1 second, the key will light and the alarm messages remain displayed. The alarm will stay silent until the key is pressed again.

	WARNING: The 75023 will only keep the last setting. When the 75023 is turned on, user should check whether the current setting meets conditions of user.
--	---

5.3.4 When an Alarm Occurs

When an alarm occurs, observe the following steps to take proper actions:

- 1) Check the user's condition.
- 2) Confirm the alarm parameter or alarm category.
- 3) Identify the source of the alarm.
- 4) Take proper action to eliminate the alarm condition.

- 5) Make sure the alarm condition is corrected.
For troubleshooting specific notices, see 5.5.3.

5.3.5 Reset to Default Settings

- 1) Press button [SET]→[CON] and Press the Up/Down button, set the value to "SET".
- 2) Press button [SET].
- 3) Reset to default value



- 4) The default values are as below

VOL: 05
ALm: 05
PA: ADU
BMP H: 90
BMP L: 40
%SPo2: L 90

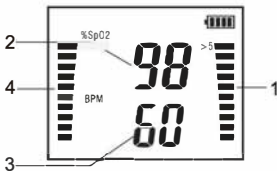
5.4 SpO2 & PR Measurement

5.4.1 Placing The Sensor Onto The User's Finger

- 1) Select an appropriate SpO2 sensor according to the person category and weight.
- 2) Place the sensor on the appropriate measurement site.
- 3) Connect an approved SpO2 sensor or extension cable to the 75023 SpO2 sensor port.



5.4.2 Display Description



1	perfusion index signal intensity bar
2	Measured %SPO2
3	Measured BPM
4	Pulse amplitude index signal intensity bar

**WARNING**

	Use only SpO2 sensors specified in this manual. Follow the SpO2 sensor's instructions for use and adhere to all warnings and cautions.
	When a trend toward deoxygenation is indicated, blood samples should be analyzed by a laboratory co-oximeter to completely understand the person's condition.
	Do not use the pulse oximeter and the SpO2 sensor during magnetic resonance imaging (MRI). Induced current could cause burns.
	Reusable sensor must be moved to new site at least every four hours. Because individual skin condition affects the ability of skin to tolerate sensor placement, it may be necessary to change the sensor site more frequently with some patients. If skin integrity changes, move the sensor to another site.
	Do not apply tape to secure the sensor in place or to tape it shut; venous pulsations may lead to inaccurate saturation measurements.
	As with electrosurgical unit, carefully route patient cabling to avoid entanglement.
	Do not use the SpO2 sensor on a limb with an intravenous infusion or arterial catheter in place.
	Do not use the SpO2 sensor on a limb where the NIBP cuff is applied. This may result in inaccurate SpO2 reading due to blocked blood flow during cuff inflation.
	WARNING: Pulse oximetry readings and pulse signals can be affected by certain ambient environmental conditions, sensor application errors, and certain patient conditions. See the appropriate sections of the manual for specific safety information.
	Caution: Use only Accurate-approved sensors and extension cables.
	<p><i>Note:</i> Physiological conditions, medical procedures, or external agents that may interfere with the 75023's ability to detect and display measurements include:</p> <ul style="list-style-type: none"> ● Dysfunctional hemoglobin ● Arterial dyes ● Low perfusion ● Dark pigment ● Externally applied coloring agents, such as nail polish, dye, or pigmented cream. <p>Inaccurate measurements can be caused by:</p> <ul style="list-style-type: none"> ● Incorrect application of the sensor ● Placement of the sensor on an extremity with a blood pressure cuff, arterial catheter, or intravascular line ● Ambient light

- Prolonged and/or excessive patient movement
- Intravascular dyes or externally applied coloring, such as nail polish or pigmented cream
- failure to cover the sensor site with opaque material in high ambient light conditions

Loss-of-pulse signal can occur for the following reasons:

- The sensor is applied too tightly
- A blood pressure cuff is inflated on the same extremity as the one with the sensor attached
- There is arterial occlusion proximal to the sensor
- Poor peripheral perfusion

Note: An extension cable may be used to provide more distance between the 75023 and the sensor. Use the extension cable available from Concord Health Supply.

5.5 Alarm Notifications

Notifications triggered by a vital sign that appears abnormal or by technical problems of the Pulse Oximeter, are presented to the user by visual and audible notification indications.

5.5.1 Alarm Notification Categories

By nature, the pulse oximeter's notifications can be classified into three categories: physiological, technical and prompt messages.

1) Physiological notifications

Physiological notifications, also called patient status notifications, are triggered by a monitored parameter value that violates set notice limits or an abnormal user condition.

2) Technical notifications

Technical notifications, also called system status notifications, are triggered by a device malfunction or user data distortion due to improper operation or system problems.

3) Prompt messages

Prompt messages are not notification messages and are displayed in the technical notice area. Apart from the physiological and technical messages, the pulse oximeter will show some messages which indicate the system status.

5.5.2 Visual Alarm Notification levels

By severity, the pulse oximeter's physiological notifications can be classified into three categories: high level notifications, medium level notices and low level notifications.

1) High level notifications

Indicate that the user is in a life threatening situation and an

emergency treatment may be required.

2) Medium level notifications

Indicate that the user's vital signs appear abnormal and an immediate treatment is required.

3) Low level notifications

Indicate that the user's vital signs appear abnormal and an immediate treatment may be required.

5.5.3 Alarm Notification Indicators

When a notification occurs, the pulse oximeter will indicate it through the following indications:

- Notification lamp
- Notification tone
- Notification message

For different notification levels, the notification lamp, tone and messages presented are different.

1) Notification Lamp

If a technical or a physiological notification occurs, the notification lamp will flash. The flashing color and frequency match the notification level as follows:

- High level notifications: the lamp quickly flashes red.
- Medium level notifications the lamp slowly flashes yellow.
- Low level notifications: the lamp turns yellow without flashing.

2) Notification Tones

When a technical or a physiological notification occurs, the pulse oximeter presents different notification tone patterns to match the notification level:

- High level notifications: triple + double + triple + double beep.
- Medium level notifications: triple beep.
- Low level notifications: single beep.

3) Notification Messages

When an notification occurs, a notification message will appear in the technical or physiological notification area. This time lists only the most important physiological and technical notification messages. In the tables below, "H" means high, "M" means medium and "L" means low. The "Cause and actions" column gives recommendations to instruct you to troubleshoot the problems. If the problem persists, contact your service personnel.

Physiological Notification Messages

Notice	Notification Message	Notice Level	Cause and actions
SpO2 Too High	SPO2 reading will flash. Notification lamp is red and flashing.	H	A measurement has risen above the high alarm limit or fallen below the low notice limit. Check the person's condition and check if the person category and notice limit settings are correct.
SpO2 Too Low	SPO2 reading will flash. Notification lamp is red and flashing.	H	
PR Too High	PR reading will flash. Notification lamp is red and flashing.	H	
PR Too Low	PR reading will flash. Notification lamp is red and flashing.	H	
No Pulse	PR and SPO2 reading is " - - ". Notification lamp is red and flashing.	H	The pulse signal was too weak to be analyzed. Check the person's condition, SpO2 sensor and measurement site.
Low Perfusion	Notification Lamp remains yellow. The screen will show "Low Perfusion"	L	The pulse signal was weak and please Check the user's condition, check SpO2 sensor and measurement site.
Low signal Quality	Notification lamp is yellow and flashing. The screen will show "Low Signal Quality"	M	The pulse signal was too weak, Check the person's condition, SpO2 sensor and measurement site.

Technical Notification Messages

Notice	Notification Message	Notice Level	Cause and actions
Sensor Off	Notification lamp is yellow and flashing. The screen will show "OFF"	M	The SpO2 sensor detached from the person the pulse oximeter, or there was a fault with the SpO2 sensor, or an unspecified SpO2 sensor was used. Check that the sensor application site and the sensor type are correct, and make sure that the sensor is undamaged. Reconnect the sensor if the sensor is disconnected or use a new sensor if the sensor is damaged, for example.

NOTE: When multiple notices of different levels occur simultaneously, the pulse oximeter will select the notice of the highest level and give visual and audible notice indications accordingly.

5.6 Measurement Limitations

If you doubt the SpO₂ measurements, check the person's vital signs first. Then check the pulse oximeter and SpO₂ sensor. The following factors may influence the accuracy of measurements:

- Ambient light
- Physical movement (person or imposed motion)
- Diagnostic testing
- Low perfusion
- Electromagnetic interference, such as MRI environment
- Electrosurgical units
- Dysfunctional haemoglobin, such as carboxyhemoglobin (COHb) and methemoglobin (MetHb)
- Presence of certain dyes, such as methylene and indigo carmine
- Inappropriate positioning of the SpO₂ sensor, or use of incorrect SpO₂
- Drop of arterial blood flow to unmeasurable level due to shock, anemia, low temperature or vasoconstrictor.

6 Summary of Spo2 & Pulse Rate Accuracy Testing

- 1) According to ISO80601-2-61, the 300 data pairs (SPO₂ VS SaO₂) were obtained throughout the hypoxia breathe-down trials in all 12 volunteers. The SpO₂ accuracy specification in the range of 70% to 100%, 70% to 80%, 80% to 90%, and 90% to 100% is as the following table:

Pulse Oximeter	SPO ₂ Sensor	SpO ₂ Range			
		100%-70%	100% - 90%	90% - 80%	80% - 70%
75023	U403-01	1.3910	1.2555	1.3774	1.5687

- 2) The data from the hypoxia breathe-down trials for each of the 12 volunteers is summarized in Figures 1&2:

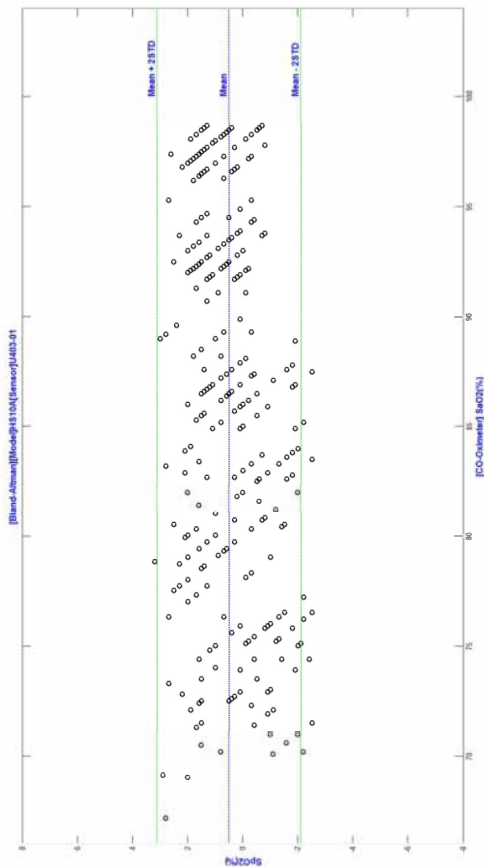


Figure 1 Bland-Altman

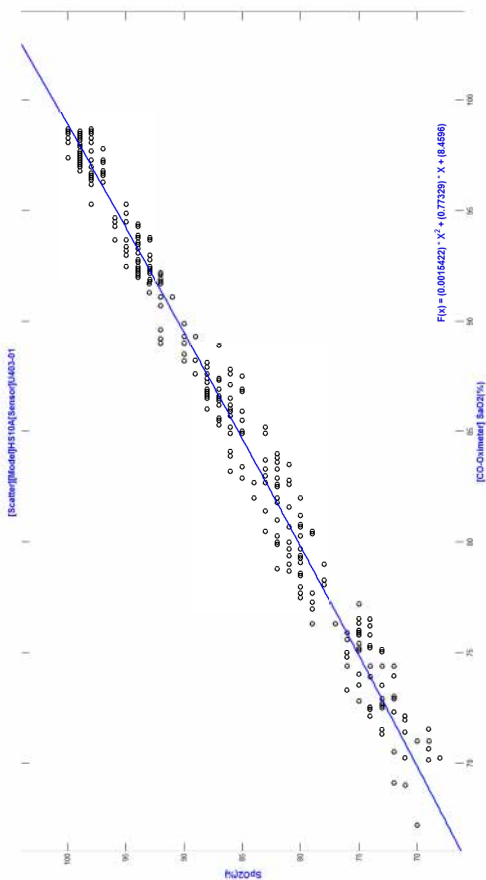


Figure 2 Linear Regression

- 3) The pulse rate accuracy as follows covers the entire pulse rate display range of 30~250bpm and spo2 range of 70~100%.

Pulse Oximeter	Sensor	Range 25-250	Accuracy of each level Spo2				
			77% - 70%	84% - 78%	92% - 85%	97% - 92%	100% - 97%
75023	U403-01	1.20	1.17	1.00	0.67	1.33	1.83

The results above suggest that the SPO2 accuracy is within $\pm 2\%$ in range 70-100% and the pulse rate accuracy is less than ± 3 in range 25~250 bpm, which meets the requirements of ISO80601-2-61.

7 Maintenance

7.1 Cleaning



WARNING: Do not spray, pour, or spill any liquid on the 75023, its accessories, connectors, switches, or openings in the chassis as this may damage the pulse oximeter.

For surface-cleaning and disinfecting use the steps outlined below:

To surface clean the monitor:

- 1) Obtain a soft cloth.
- 2) Dampen the cloth with either a commercial, non-abrasive cleaner or a solution of 70% alcohol in water.
- 3) Lightly wipe each exterior surface using the dampened soft cloth.

To disinfect the monitor:

- 1) Saturate a soft cloth with 10% solution of chlorine bleach in tap water.
- 2) Lightly wipe each exterior surface using the saturated soft cloth.



Caution: Before attempting to clean an SpO2 sensor, read the directions for use enclosed with the sensor. Each sensor model has specific cleaning instructions.

7.2 Safety Checks

Before first use, or at least every two years, or whenever your pulse oximeter is repaired or upgraded, a thorough inspection should be performed by qualified service personnel to ensure the reliability.

Follow these guidelines when inspecting the equipment:

- Make sure that the environment and power supply meet the requirements.
- Inspect the equipment and its accessories for mechanical damage.
- Inspect all power cords for damage, and make sure that their insulation is in good condition.
- Make sure that only specified accessories are applied.

- Inspect if the notice system functions correctly.
- Make sure that the batteries meet the performance requirements.
- Make sure that the pulse oximeter is in good working condition.

In case of any damage or abnormality, do not use the pulse oximeter.
Contact Concord Health Supply personnel immediately.

7.3 Disposal

Dispose of the pulse oximeter in accordance with local environment and waste disposal laws and regulations. For the disposal of SpO2 sensor, follow local regulations regarding disposal of user waste.

8 Accessories

WARNING

- Use only accessories specified in this manual. Using other accessories may cause damage to the pulse oximeter.
- Disposable accessories are designed for single-person use only. Reuse of them may cause a risk of contamination and affect the measurement accuracy.
- Check the accessories and their packages for any sign of damage. Do not use them if any damage is detected.
- The SpO2 sensor mentioned in this chapter meet the bio-compatibility requirements and complies with ISO 10993-1, ISO 10993-5 and ISO10993-10 standards.
- Inspect the application site every 2 hours and relocate the sensor for ring finger again (more frequently if perfusion is poor).
- Do not immerse or wet the sensor.
- Do not lift the 75023 by the sensor or the extension cable because the cable could disconnect from the 75023, causing the 75023 to drop on the user.

Information Of Sensor

Model	Picture	Name	Testing position	Intended crowd
U403-01		Reusable Adult Finger Clip SpO2 Sensor	Finger	Adult (≥40kg)

Sensor Usager

- 1) Hold the sensor with its opening towards the user's index or ring finger (Fig. 1). The sensor should be oriented in such a way that the sensor side with a finger tip sign is positioned on the top.



Figure 1

- 2) Insert the user's index or ring finger into the sensor until the fingernail tip rests against the stop at the end of the sensor. Adjust the finger to be placed evenly on the middle base of the sensor. Direct the cable along the top of the user's hand.
- 3) Inspect the sensor site every 2 hours for skin integrity and relocate the sensor every 2 hours according to step 1~2.

9 Specifications

Environmental specifications	Operating conditions	Storage conditions
Temperature (°C)	5 to 40	-20 to 60
Relative humidity (non-condensing)	15% to 95%	15% to 95%
Hardware specifications		
Display	Color LCD, 2.4"	
Power indicating lamp	1. lighting green and yellow	
Loudspeaker	1. Gives audible notice (45 to 85dB) and button tone; Supports Pitch Tone and multi-level volume.	
Notice indicating lamp	1. lighting red and yellow	
Sensor connector	1. 9-pin type D connector	
Powersupply connector	1. used to connecting the Charger stand	

Communication port	No
Data storage	No
Shelf life	5 Years
Alkaline batteries	
Quantity	3
Specification	1.5 V, AA
Specification	2000 mAh
Run time	22 hours with SpO2 monitored continuously, audio indicators off and backlight brightness set to minimum using a new, fully charged battery at ambient temperature 25 °C
Shutdown delay	Max. 10 minutes after the low battery notice first occurs
Measurement specifications	
Spo2	
Display Range	1 to 100%
Resolution	1%
Accuracy	70 to 100%: $\pm 2\%$ (measured without motion) 0% to 69%: Unspecified
PR	
Display Range	25 to 300 bpm
Resolution	1 bpm
Accuracy	25 to 250bpm: ± 3 bpm (measured without motion)
Refreshing rate	1 s
Physical specifications	
Width × Height × Depth	56×124×30 mm
Max. weight	about 300g (full configuration, including the batteries)

10 EMC Information

The device meets the requirements of IEC 60601-1-2:2007.

Guidance and Declaration - Electromagnetic Emissions		
The device is suitable for use in the electromagnetic environment specified below. The customer or the user of the device should assure that it is used in such an environment.		
Emission tests	Compliance	Electromagnetic environment - guidance
Radio frequency (RF) emissions CISPR 11	Group 1	The 75023 uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment. The 75023 is suitable for use in all establishments other than domestic and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Radio frequency (RF) emissions CISPR 11	Class A	
Harmonic emissions IEC 61000-3-2	Not applicable	
Voltage fluctuations/flicker emissions 61000-3-3	Not applicable	

Guidance and Declaration - Electromagnetic Immunity			
The device is suitable for use in the electromagnetic environment specified below. The customer or the user of the device should assure that it is used in such an environment.			
Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment - guidance
Electrostatic discharge IEC 61000-4-2	±6 kV contact ±8 kV air	±6 kV contact ±8 kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30 %. If ESD interfere with the operation of equipment, counter measurements such as wrist strap, grounding shall be considered. Mains power quality should be that of a typical commercial or hospital environment.
Electrical fast transient/burst(EFT) IEC 61000-4-4	±2 kV for power supply lines ±1 kV for input/output lines (>3m)	Not applicable	
Surge IEC 61000-4-5	±1 kV differential mode ±2 kV common mode	Not applicable	

Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	<p><5 % UT (>95 % dip in UT) for 0.5 cycles</p> <p>40 % UT (60 % dip in UT) for 5 cycles</p> <p>70 % UT (30 % dip in UT) for 25 cycles</p> <p><5 % UT (>95 % dip in UT) for 5 s</p>	Not applicable	Mains power quality should be that of a typical commercial or hospital environment. If the user of the 75023 requires continued operation during power mains interruptions, it is recommended that the 75023 be powered from an uninterruptible power supply or a battery.
Power frequency (50/60 HZ) magnetic field IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.

Note: UT is the AC mains voltage prior to application of the test level.

Guidance and Declaration - Electromagnetic Immunity

The device is suitable for use in the electromagnetic environment specified below. The customer or the user of the device should assure that it is used in such an environment.

Immunity tests	IEC 60601 test level	Compliance level
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz	NA
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2.5 GHz	3 V/m.


Electromagnetic environment - guidance

Portable and mobile RF communications equipment should be used no closer to any part of the device, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended Separation Distance:

$$d = 12 \sqrt{P}$$

$$d = 12 \sqrt{P} \quad 80 \text{ MHz to } 800 \text{ MHz}$$

$$d = 23 \sqrt{P} \quad 800 \text{ MHz to } 2.5 \text{ GHz}$$

where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey, should be less than the compliance level in each frequency range. Interference may occur in the vicinity of equipment marked with the symbol .

Note 1: From 80 MHz to 800 MHz, the higher frequency range applies.

Note 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

a: Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the device is used exceeds the applicable RF compliance level above, the device should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the device.

b: Over the frequency range from 150kHz to 80MHz, field strengths should be less than 3V/m.

Recommended Separation Distances between Portable and Mobile RF Communications Equipment and The device

The device is suitable for use in an electromagnetic environment in which radiated RF disturbance are controlled. The customer or the user of the device can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the device as recommended below, according to the maximum output power of the communication equipment.

Rated Maximum Output power of Transmitter (W)	Separation Distance (m) Corresponding to Frequency of Transmitter		
	150k to 80MHz $d = 1.16 \sqrt{P}$	80M to 800MHz $d = 1.16 \sqrt{P}$	800M to 2.5GHz $d = 2.33 \sqrt{P}$
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 transmitters at a maximum output power not listed above, the separation distance can be estimated using the equation in the corresponding column, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

Note 1: From 80 MHz to 800 MHz, the higher frequency range applies.

Note 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

