



Vpod Vital Pro
Table Top Oximeter
USER MANUAL

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CHAPTER 1 Introduction

1.1 About the Manual

Before using the Vpod Vital Pro, the user must carefully read this manual so that the user can operate the monitor properly and make it reach the specific safety standard and performance index.

This manual explains how to set up and use the monitor. Important safety information relating to general use of the monitor appears after this introduction. Other important safety information is located throughout the text where appropriate.

Note: There requires no routine calibration, safety maintenance or in-service during the monitor's life.

1.2 Contraindications

- Active patients.
- Intravascular dyes such as indocyanine green or methylene blue.
- Significant levels of dysfunctional hemoglobins (such as carbonxy- hemoglobin or methemoglobin).
- The presence of high ambient light. Shield the sensor area (with a surgical towel, or direct sunlight, for example) if necessary.
- Venous pulsations may cause erroneous low readings(e.g. tricuspid valve regurgitation)
- Venous congestion may cause under reading of actual arterial oxygen saturation. Therefore, assure proper venous outflow from monitored site. Sensor should be not below heart level(e.g. sensor on hand of a patient in a bed with arm dangling to the floor)
- Avoid placing the sensor on any extremity with an arterial catheter, intravascular line or blood pressure cuff.
- Exercise caution with poorly perfuse patients; skin erosion and/or pressure necrosis may occur.
- Do not use the monitor when the patient in cardiac arrest or in defibrillation.

1.3 Safety Information

Warnings alert the user to potential serious outcomes, such as death, injury, or adverse events to the patient or user.

Cautions alert the user to exercise care necessary for the safe and effective use of the Vital sign monitor.

Notes contain important information that may otherwise be overlooked or missed.

Warnings

- The monitor must be able to measure the pulse properly to obtain an accurate SpO₂ measurement. Verify that nothing is hindering the pulse measurement before replying on the SpO₂ measurement.
- Do not use the monitor in a MRI or CT environment
- Explosion hazard: Do not use the monitor in the presence of flammable anesthetic or in an explosive atmosphere.
- Do not make any clinical judgments based solely on the monitor. The monitor is intended only as an adjunct in patient assessment. It must be used in conjunction with clinical signs and symptoms.
- Prolonged use or the patient's condition may require changing the sensor site periodically. The site must be checked at least every four (4) hours to ensure adequate adhesion, circulation, skin integrity and correct optical alignment. If the circulatory condition or skin integrity is compromised, the sensor should be applied to a different site.
- Use only SpO₂ sensors provided by manufacturer for SpO₂ measurements. Other SpO₂ sensors may cause improper performance.
- Use only the battery, power core provided and any accessories appointed by manufacturer, for other accessories may cause improper performance or dangerous.
- Do not use tape to secure the sensor to the site; this can restrict blood flow and cause inaccurate readings. Use of additional tape can cause skin damage or damage the sensor.
- Dispose of the device and its accessory according to applicable local regulations.
- To avoid an electrical hazard, never immerse the unit in any fluid or attempt to clean it with liquid cleaning agents. Always disconnect monitor from AC Main Power before performing cleaning of maintenance.


























- If monitor becomes accidentally wet during use, discontinue operation of the monitor until all affected components have been cleaned and permitted to dry completely. Contact our local representative if additional information is required.
- Connect the monitor to a three-wire, grounded, hospital-grade receptacle.
- The signal output part can be only connected to the computer complying with the requirements of IEC60950.

Cautions!

- Before use the equipment, inspect whether all the cables are in good condition, the damaged cables and connectors must be replaced. Operator should examine whether the system is in correct working state and operating condition.
- To prevent damage, do not soak or immerse the sensor in any liquid solution.
- Do not sterilize by irradiation, steam, autoclave or ethylene oxide.
- Operation of the monitor may be affected by the use of an electrosurgical unit (ESU).
- The pulsations from intra-aortic balloon support can be additive to the pulse rate on the oximeter pulse rate display. Verify patient's pulse rate against the ECG heart rate.
- By replacing the fuse, please use the safety device of the same type and rated fuse.
- As with all medical equipment, carefully route patient cabling to reduce the possibility of patient entanglement or strangulation.
- To avoid monitor fall, secure monitor on the shelf or bracket prior to use.
- If any parameters displayed on monitor and working station are not accurate, adopt the other methods to diagnosis patient.
- The medical equipment must be manipulated by personnel who have already got relative training of operation.
- Single-use devices should never be reused
- The monitor may not conform to all performance specifications. If stored or used outside the environmental specifications identified in specification in the rear of this manual.
- If the accuracy of any measurement does not seem reasonable, first check the patient's vital signs by alternate means and then check the monitor for proper functioning.
- Alarm must be set up according to different situation of individual patient. Make sure that audio sound can be activated when alarm occurs.
- When an "X" appears in the Alarm Bell symbol, the audible alarm tone will not sound for any reason.
- Do not only depend on the alarm system, the doctor and nurse will not draw attention when an alarm turn down or turn off.
- When connecting the monitor to any instrument, verify proper operation before clinical use. Refer to the other device's manual for full instructions. Accessory equipment connected to the monitors data interface must be certified according to IEC Standard 60601-1 for electro medical equipment. All combinations of equipment must be in compliance with IEC Standard 61601-1-1 systems requirements. To avoid potentially hazardous leakage currents, always check the summation of leakage currents when several item of equipment are interconnected.
- For proper equipment maintenance, perform the service procedures at the recommended intervals as described in the manual.
- If the monitor needs to be used continuously long-term, please note to connect the monitor with the main power supply by the alarm of battery, otherwise, the monitor will automatically shut down, which leads to the break-off of the monitoring.
- Do not use the monitor during Magnetic Resonance Imaging (MRI) scanning. Induced current could potentially cause burns. The monitor may affect the MRI image, and the MRI unit may affect the accuracy of the monitor measurements.
- Do not place the monitor in any position that might cause it to fall on the patient. Do not lift the monitor by the power supply cord or patient connections.
- The monitor can monitor only one patient synchronously.

- As to the other points for attention, please carefully read the relevant chapter in this instruction.
- FEDERAL LAW (U.S.A) restricts this device to sale by or on the order of a physician.

1.4 Explanation of Symbols

	Caution		Class I Equipment
	Arterial oxygen saturation SpO ₂ plethysmogram		Pulse rate
	Resistant defibrillator BF type equipment		Power on/off button
	Alarm sound on indicator		Alarm sound off indicator/Return
	Pulse beep sound on indicator		Pulse beep sound Silence indicator
	The oximeter can be used as a USB device		AC 50/60 HZ
	The NET connection is in good order		The NET connection is off
	Down/decrease button		Up/increase button
	Print button		Remaining Battery power indicator
	Confirm button		Fuse
	Equipotential grounding terminal		AC power supply
	Follow instruction for use		Resistant to liquid ingress
	Waste electrical and electronic equipment		

1.5 Intended Use

The VPOD Vital Pro vital sign monitor is a portable device indicated for use in non-invasively measuring and displaying functional oxygen saturation of arterial haemoglobin (SpO₂), pulse rate and PI of adult and pediatric patients in hospitals, medical facilities. The vital sign monitor is intended for spot-checking and/or continuous monitoring of patients.

CHAPTER 2 Overview of Monitor

2.1 Special Feature

- AC power and internal rechargeable battery
- Anti-high-frequency electrosurgical equipment
- LED & LCD display
- Display: SpO₂, Pulse rate, PI, Pulse bar and SpO₂ waveform
- Convenient clinic operation
- Up to 99 patient information and 72 hours record storage
- Visible & 3-level audible alarm
- Battery-low indication
- Built-in rechargeable battery or AC power
- Built-in thermal recorder(optional)
- Support wired LAN (optional)
- USB Data upload (optional)
- Data storage and replay
- Probe suitable for adult and pediatric

2.2 Appearance of Monitor

2.2.1 Front panel and displaying

Description of Fig.2.1:

1. Printing button: Press this button in measuring screen you can print the real-time records' data and waveform. In measuring screen press the button once more you can cancel printing.
2. Navigation button (Down): Press this button you can select different item and decrease the number.
3. Navigation button (Up): Press this button you can select different item and increase the number.
4. Alarm silence button / Return button: ONLY in the measuring screen, press this button when the alarm sound is on, you can temporarily silences the audible alarm sound for one minute press this button again you can cancel the alarm silence operation. If in the selection screen of menu, press this button you can return to the previous menu or the previous screen.
5. MENU/OK button: Press this button to enter the main menu or confirm your selection or select the different item, refer to the following reference operation instruction for details.
6. CHG indicator: Battery charge indicator. If the battery is charging the light will flash.
7. Internal battery indicator:
Battery power enough: The light always on
Battery low: The light will be flashing.
Without battery: The light will be closed.

8. Power switch: Press the button for 3 seconds you can turn on the monitor, or press the button for 4 seconds you can turn off the monitor.
 9. LCD displaying screen: Display the SpO₂ waveform, PI, the date & time, the alarm limit, system icon and ID number.
 10. Pulse amplitude indicator (blip bar).
 11. Measured pulse Rate display (the first number after the decimal point can be displayed)
 12. Measured SpO₂ % display
 13. SpO₂ sensor port
- 2.2.2 Rear panel

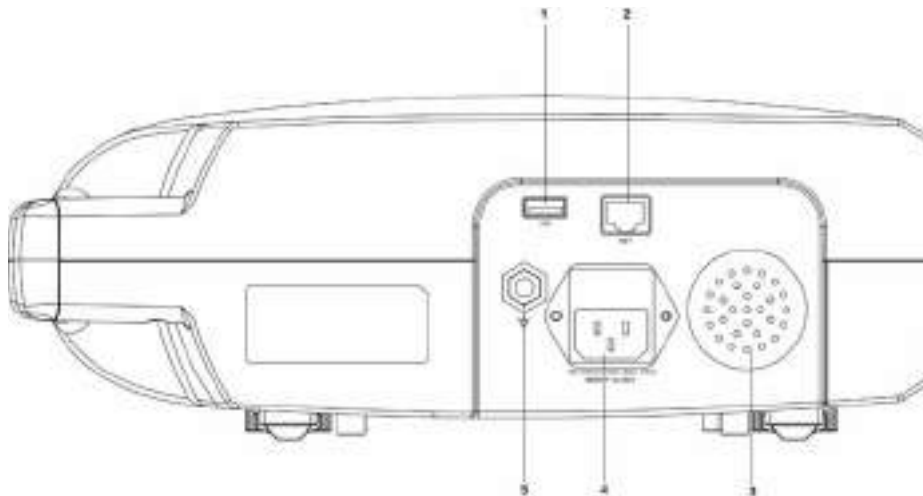


Fig. 2.2

Description of Fig.2.2:

- 1 USB Interface: The monitor can be used as the USB device.
- 2 NET: The NET socket connecting with the center monitor system of our company.
- 3 Speaker
- 4 Power socket: AC Power supply socket.
- 5 Ground terminal

2.2.3 Battery

7.2 V, 2500mAh lithium battery

Note:

- If the monitor is not used for long time, please charge and discharge the battery thoroughly once a month.

⚠ Warning!

Do not use the battery not appointed by our company.

2.2.4 Grounding wire connection

Connect the oximeter and the ground system with grounding wire (refer to Fig.2.3), as the following steps: Firstly, plug the socket 1 to the oximeter's grounding terminal as Fig.2.4 shown.

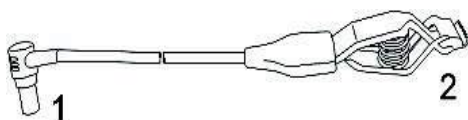


Fig.2.3

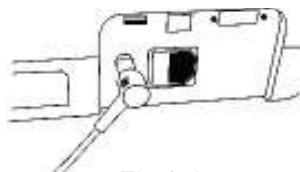


Fig.2.4

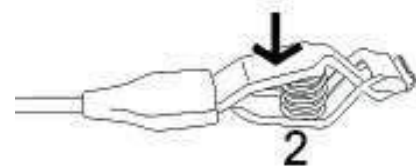


Fig.2.5

Secondly, press the clap on the other terminal of the grounding wire to connect with the user's ground system. Refer to Fig. 2.7

2.2.5 Printer (Optional)

The monitor can print the stored records and SpO₂ waveforms if the customer selects the oximeter with SP-B6J printer.

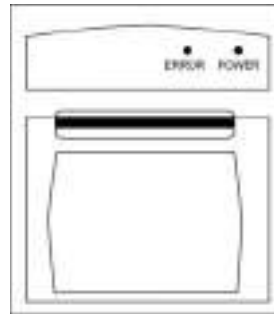


Fig.2.6

1. Error indicator—the light will be light when there is no paper.
2. Printer power indicator—when the printer printing records the light will be light.

Paper replacement

Note : Record paper requirement

Only standard 50(+0/-1) mm thermo sensitive record paper can be used, otherwise the recorder may not function, the recording quality may be poor, and the thermo sensitive print head may be damaged.

Steps for paper replacement:

1. Open b the paper cassette door.
2. Place a new roll of paper into the paper cassette door with a few inches of paper being unrolled. And then push slightly the roll of paper to the paper cassette (refer to the Fig.2.7). Ensure proper orientation of paper roll.

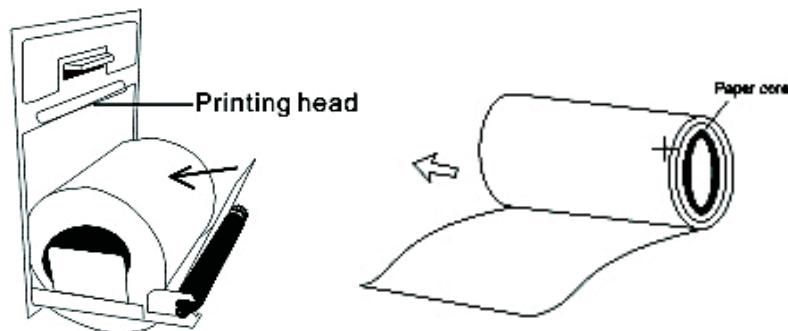


Fig.2.7

3. Close the paper cassette door with a few inches of paper being kept outside of the door.

NOTE

- When the recorder is working, the record paper goes out steadily. Do not pull the paper, or the recorder may be damaged.
- Do not operate the recorder without record paper.
- Make sure that the paper surface with the heat sensitive material towards to the heat sensitive printing head.

2.3 Specification

Power supply

Mains power	100 V ~ 230V AC, 50Hz/60Hz±3Hz
Internal power	7.2V DC
Rated input current	75mA
Rated power input	Less than 25VA
Fuse (51F)	250V I _{max} 1 A

Environment

The operation environment should comply with the following conditions:	
Operating Temperature:	5°C ~ 40°C
Relative Humidity:	≤ 80%, non-condensing
Standard Atmosphere Pressure :	86kPa~106kPa
The transport and storage environment should comply with the following conditions:	
Storage Temperature:	-20°C ~ 55°C
Relative Humidity:	0% ~ 93%, non-condensing
Standard Atmosphere Pressure :	86kPa~106kPa

Display

Type:	LCD & LED
-------	-----------

LED Specification

	Wavelength	Radiant Power
RED	660±3nm	3.2mW
IR	905±10nm	2.4mW

SpO₂

Display range	0% ~ 100%
Measurement Range	70%~100%
Accuracy	70%~100% ≤±2%; 0%~69% no definition
Alarm delay	SpO ₂ high and low limits alarm delay<7s
Display Update	<5s
Resolution	1%

Pulse Rate

Measurement Range	30bpm ~ 250bpm
Resolution	1bpm
Accuracy	30bpm~99bpm, ±2bpm; 100bpm~250bpm, ±2%
Alarm delay	Pulse rate high and low limits alarm delay<7s

PI

Measurement Range	0.2% ~ 20%	
Accuracy	0.2%~1.0%	±0.2%
	1.1%~20%	±20%

Alarm Setting Range

Parameter	SpO ₂ %	PR (bpm)
Upper alarm range	71%~100%	31bpm ~235bpm
Low alarm range	70%~99%	30bpm ~234bpm

Classifications

Protection Class	Type BF defibrillation proof
Protection against moisture	IPX1

CHAPTER 3 Patient Safety

The vital sign monitor is designed to comply with the International Safety requirements for medical electrical equipment. This device has floating inputs and is protected against the effects of defibrillation and electrosurgery. If the correct electrodes and ECG cable are used and applied in accordance with the manufacturer instructions, the screen display will recover within 10 seconds after defibrillation.

3.1 Environment

Follow the instructions below to ensure a completely safe electrical installation. The environment where the monitor Portable Monitor will be used should be reasonably free from vibration, dust, corrosive or explosive gases, extremes of temperature, humidity, and so on. For a cabinet mounted installation, allow sufficient room at the front for operation and sufficient room at the rear for servicing with the cabinet access door open.

The Monitor operates within specifications at ambient temperatures between 0°C and 40°C. Ambient temperatures that exceed these limits could affect the accuracy of the instrument and cause damage to the modules and circuits. Allow at least 2 inches (5cms) space around the instrument for proper air circulation.

3.2 Condensation

Make sure that during operation, the instrument is free of condensation. Condensation can form when equipment is moved from one building to another, thus being exposed to moisture and differences in temperature.

3.3 Grounding

To protect the patient and hospital personnel, the cabinet of The Portable Monitor must be grounded. Accordingly, The Portable Monitor is equipped with a detachable 3-wire cable which grounds the instrument to the power line ground (protective earth) when plugged into an appropriate 3-wire receptacle. If a 3-wire receptacle is not available, consult the hospital electrician. If the capacity of the protective grounding wires is in doubt, the equipment must be operated with internal power supply.

CHAPTER 4 Getting Started

NOTE

To ensure that the monitor works properly, please read Chapter 3, and follow the steps before using the monitor.

4.1 Unpacking and Inspection

Open the package and take out the monitor and accessories carefully. Keep the package for possible future transportation or storage. Check the components according to the packing list.

- Check for any mechanical damage.
- Check all the cables, modules and accessories.

If there is any problem, contact the distributor immediately.

4.2 Connect the Power Cables

Connection procedure of the AC power line:

Make sure the AC power supply complies with following specification: 100-230 (VAC), 50/60 (Hz). Ensure that the AC outlet is properly grounded.

- (1) Apply the power line provided with the monitor. Plug the power line into the power socket on the rear panel.
- (2) Connect the other end of the power line to a grounded 3-line power output.

NOTE

- Connect the power line to the jack special for hospital usage.
- The battery needs to be charged after transportation or storage. If the power supply is not properly connected before turning on the monitor, it may not work properly because of insufficient power. Connect the mains power supply to charge the battery.

4.3 Power on the Monitor

After the oximeter sensor is connected to its input cables, turn the monitor on by momentary pressure on the front-panel POWER button (on the front panel) for 3 seconds. Audible feedback after pressing, the monitor initiates monitoring operation.

NOTE

- Check all the functions that may be used to monitor and make sure that the monitor is in good status.
- The battery must be recharged to the full electricity after the battery low indicator appears.
- Suggest recharging the battery to the full electricity after each use of monitoring so as to reserve sufficient power in battery.

WARNING

If any sign of damage is detected, or the monitor's display some error message, do not use it on any patient. Contact the biomedical engineer in the hospital or the distributor immediately.

4.4 Connecting Patient Sensors

Connect oximeter sensors to the monitor (refer to Fig.15 of chapter 6).

NOTE

For information on correct connection, refer to related Chapter.

4.5 Check the Recorder

If your monitor is equipped with a recorder, open the recorder door to check if paper is properly installed in the output slot. If no papers present, do not press "PRINT" function button.

CHAPTER 5 System Setting



Press the power on button for about three seconds to turn the monitor on, and then press the  button to enter into the main menu and press the  button to look through the items. Refer to Fig 5.1 and the Fig.5.2.



Fig.5.1

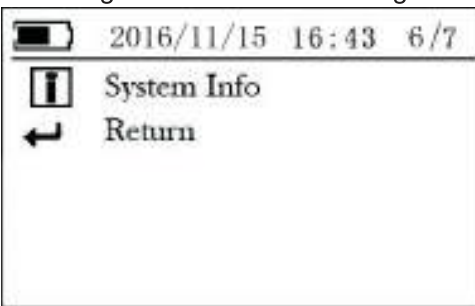









Fig.5.2

Description of main menu:

1.  Trend Management: By this menu you can review the measuring data and trend of SpO₂ %, PR.
2.  Alarm Settings: By this menu you can set the alarm mode, alarm limit.
3.  Printer Settings: By this menu you can set the parameters for print.
4.  Network Settings: By this menu you can set the net on or off and the patient bed number.
5.  System Settings: By this menu you can set the Date and Time, patient ID, pulse beep and alarm sound volume and so on.
6.  System Info: By this menu you can check software version, date and time.
7.  Return: return to the measuring screen.

5.1 Date and Time

Always set the date and time before using the unit for the first time. Set different ID number for different user. Check whether the date and time are correct before using the unit, reset them if necessary. The date and time are important indicators when a measurement is taken.



On the main menu, press the  button to select "System Settings" and press  button to confirm your selection, you will see the following picture.



Fig.5.3

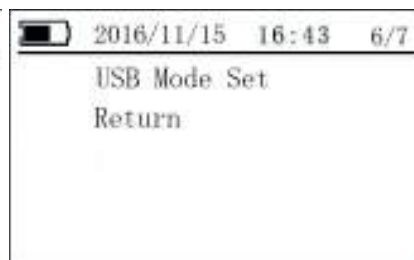


Fig. 5.4

Select the "Date and time" item and press the  button to confirm your selection. And then you will enter into the "Date and time" setting menu. (Refer to Fig.5.5).

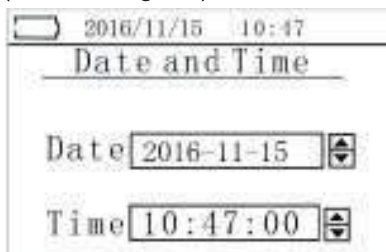





Fig.5.5

1. Press the  or  button to select the data item.
2. Press the  button to confirm.

3. Press the ▲ or ▼ button to set the increase or decrease the data.
4. Press the [Enter] button to confirm.
5. Press the [Esc] button to return to the system settings screen.

The setting ranges of the date and time are as follows:

Year: 2000-2099

Month: 01-12

Day: 1-31

Hour: 0-23

Minute: 0-59

Second: 0-59

5.2 Patient ID Set

In the system setting menu press the ▲ or the ▼ button to select "Patient ID Set" and press [Enter] button to confirm your selection, you will see the following picture.

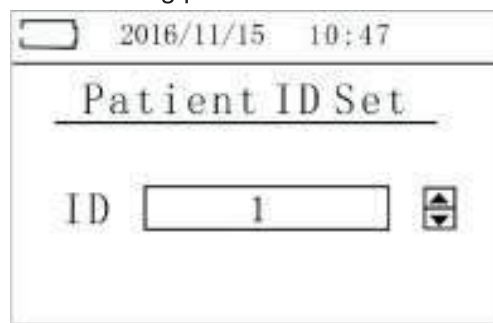


Fig.5.6

1. Press the [Enter] button to set the ID number.
2. Press the ▲ or ▼ button to set the suitable ID number.
3. Press the [Enter] button to confirm.
4. Press the [Esc] button to return to the system settings screen.

Note: The setting range of the ID number is 1~99.

5.3 Back light Set

In the system setting menu press the ▲ or ▼ button to select "Back Light Set" and press [Enter] button to confirm your selection, you will see the following picture.

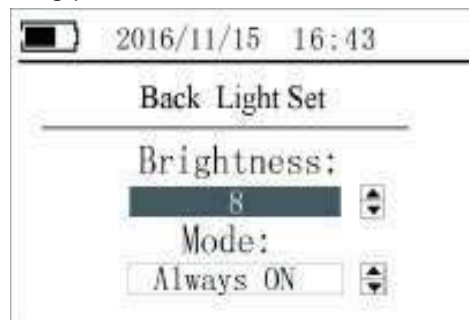


Fig.5.7

1. Press the ▲ or ▼ button to select the item.
2. Press the [Enter] button to confirm.
3. Press the ▲ or ▼ button to set the increase/decrease the data or change the mode.
4. Press the [Enter] button to confirm.
5. Press the [Esc] button to return to the system settings screen.

Notes:

1. The backlight brightness level: 1-8 and for selection.
2. Backlight mode: 1-10 minutes and “Always ON” for selection.

5.4 Pulse Beep Set

In the system setting menu press the ▲ or the ▼ button to select “Pulse Beep Set” and press [Enter] button to confirm your selection, you will see the following picture.

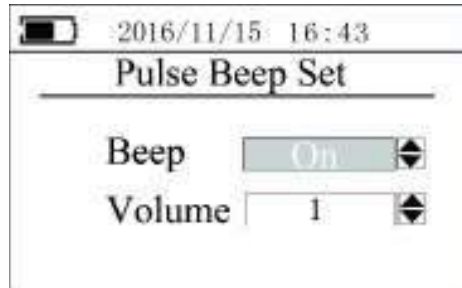


Fig.5.8

1. Press the ▲ or ▼ button to select the item.
2. Press the [Enter] button to confirm.
3. Press the ▲ or ▼ button to set the increase/decrease the data or change the beep mode.
4. Press the [Enter] button to confirm.
5. Press the [Back] button to return to the system settings screen.

Notes:

1. Beep mode: ON or OFF
 2. Beep volume: 1-8
- 5.5 Alarm Volume Set

In the system setting menu press the ▲ or the ▼ button to select the “Alarm Volume Set” item and press the [Enter] button to enter into the sub menu (refer to Fig.35).



Fig.5.9

1. Press the [Enter] button to confirm.
2. Press the ▲ or ▼ button to set the increase/decrease the data.
3. Press the [Enter] button to confirm.
4. Press the [Back] button to return to the system settings screen.

Note: Alarm volume: 1-8

5.5 USB Mode Set

In the system setting menu press the ▲ or the ▼ button to select “USB Mode Set” and press [Enter] button to confirm your selection, you will see the following picture.

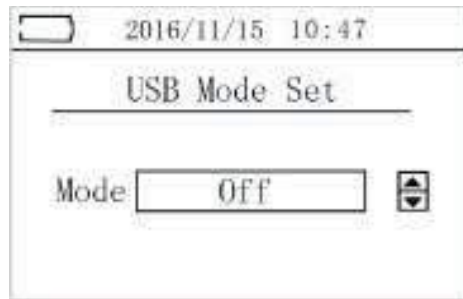


Fig.5.10

1. Press the [Enter] button to confirm.
2. Press the ▲ or ▼ button to set the USB mode.
3. Press the [Enter] button to confirm.
4. Press the [Back] button to return to the system settings screen.

Note:

USB mode: Master, Slave and Off.

The USB interface connected with the device should be no less than 2.0.

5.6 Return

After finish the system settings, you can select the return item and press the [Back] button to return to the previous menu.

CHAPTER 6 Take a Measurement

Firstly, select the suitable sensor in terms of type and dimension; secondly, connect the sensor with the monitor; Clip the sensor to the rational position of the patient finger.

NOTE: The sensor Latex Free. No toxicity, which meet biology compatibility request.



Fig.6.1

Precautions for use

1. Before use, carefully read the manual.
2. Operation of the device may be affected by the use of an electrosurgical unit (ESU).
3. The device must be able to measure the pulse properly to obtain an accurate SpO₂ measurement. Verify that nothing is hindering the pulse measurement before relying on the SpO₂ measurement.
4. Do not use the device in an MRI or CT environment.
5. Do not use the device in situations where alarms are required. The device has no alarms. It is not for continuous monitoring.
6. Do not use the device in an explosive atmosphere.
7. The device is intended only as an adjunct in patient assessment. It must be used in conjunction with other methods of assessing clinical signs and symptoms.
8. In order to ensure correct sensor alignment and skin integrity, the maximum application time at a single site for our device should be less than half an hour.
9. Do not sterilize the device using autoclaving, ethylene oxide sterilizing, or immersing the device in liquid. The device is not intended for sterilization.
10. Follow local ordinances and recycling instructions regarding disposal or recycling of the device and device components, including batteries.
11. Portable and mobile RF communications equipment can affect medical electrical equipment.
12. This equipment is not intended for use during patient transport outside the healthcare facility.
13. This equipment should not be used adjacent to or stacked with other equipment.
14. It may be unsafe to:
 - use accessories, detachable parts and materials not described in the instructions for use
 - interconnect this equipment with other equipment not described in the instructions for use
 - disassemble, repair or modify the equipment.
15. These materials that contact with the patient's skin contain medical silicone and ABS plastic enclosure are all pass the ISO10993-5 Tests for invitro cytotoxicity and ISO10993-10 Tests for irritation and delayed-type hypersensitivity.

Inaccurate measurement may be caused by

1. Significant levels of dysfunctional hemoglobin (such as carbonyl - hemoglobin or methemoglobin).
2. Intravascular dyes such as indocyanine green or methylene blue.
3. High ambient light. Shield the sensor area if necessary.
4. Excessive patient movement.
5. High-frequency electrosurgical interference and defibrillators.
6. Venous pulsations.
7. Placement of a sensor on an extremity with a blood pressure cuff, arterial catheter, or intravascular line.
8. The patient has hypotension, severe vasoconstriction, severe anemia, or hypothermia.
9. The patient is in cardiac arrest or is in shock.

- 10. Fingernail polish or false fingernails.
- 11. Weak pulse quality (low perfusion).
- 12. Low hemoglobin.

Measuring screen

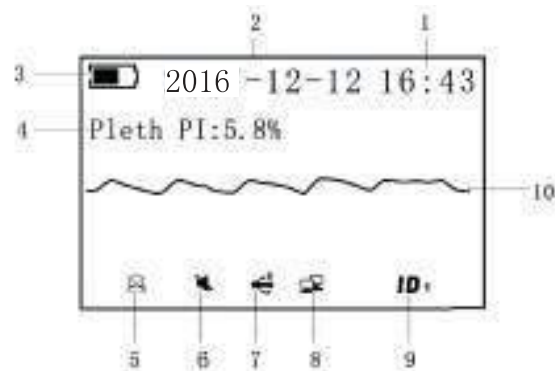


Fig.6.2

Discription of Fig.6.2:

- 1: The current time display
- 2: The current date display
- 3: Remaining battery power indicator
- 4: Measured PI display
- 5: Audible alarm status indicator. The current status in figure 2 is "audible alarm off".
- 6: Pulse beep sound status indicator. The current status in figure 2 is "Beep sound off".
- 7: The device can be used as a USB device
- 8: NET connection status indicator, the current connection status of the NET in figure 2 is in good condition.
- 9: ID number indication: The current ID number is 1.
- 10: SpO₂% waveform

CHAPTER 7 Trend Management

The monitor contains an internal memory that can store 72 hours data records. You can review, print or erase data records. If the data are cleared, they are not available to print.



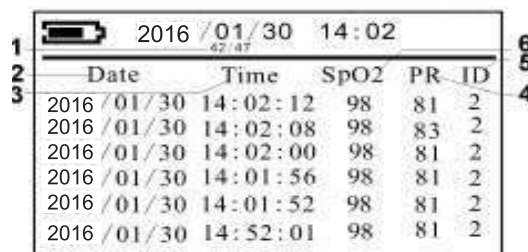
In the main menu screen, press the  or the  button to select the “Trend Management” item, and then press the  button to enter into the sub menu, you can review measured data records, SpO₂ trend, and PR trend. You can also erase data in this menu. Refer to the following pictures.



Fig.7.1

7.1 SpO₂ & PR Record

In the trend management screen, press the  or the  button to select “SpO₂ & PR Record” and press  button to confirm your selection, you will see the following picture.



1	2	3	4	5	6
Date	Time	SpO2	PR	ID	
2016 /01/30	14:02:12	98	81	2	
2016 /01/30	14:02:08	98	83	2	
2016 /01/30	14:02:00	98	81	2	
2016 /01/30	14:01:56	98	81	2	
2016 /01/30	14:01:52	98	81	2	
2016 /01/30	14:52:01	98	81	2	

Fig.7.2

Description of Fig 7.2:



1.—42/47: Means that there are 47 pages SpO₂ trend chart, the current page is the 42nd.

2,3—Date, Time: The date and time of the measured PR and SpO₂ record.

4—PR: The area of PR displaying.

5—ID: The record ID displaying area.

6—SpO₂: The measured SpO₂ data displaying area.

Note: press the  or the  button to review the records page by page.

7.2 SpO₂ Trend Review







In the trend management screen, press the  or the  button to select “SpO₂ Trend review” item and then press the  button to enter into the SpO₂ Trend review screen. Press the  or  to review the trends page by page. Press the  button to return to the previous screen.



Fig.7.3

7.3 PR Trend Review













In the trend management screen, press the  or the  button to select the “PR Trend review” item and then press the  button to enter into the PR Trend review screen. Press the  or  button to review the trends page by page. Press the  button to return to the previous screen.



Fig.7.4

7.4 Erase Data

In the trend management screen, press the  or the  button to select the “Erase Data” item and then press the  button to enter into the Erase Data screen. Press the  or  to select “Yes” or “No” to delete records or not. Press the  button to return to the previous screen.

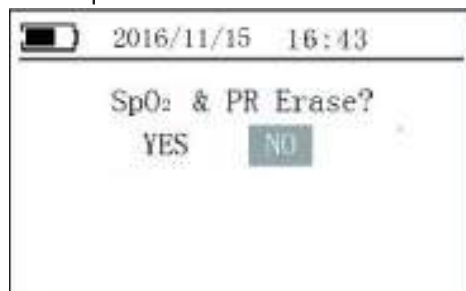


Fig.7.5

CHAPTER 8 Alarm Set

8.1 Alarm Priority

There are three-level priorities for selection.

High priority: the highest level alarm, indicate the patient is in the very dangerous situation.

Medium priority: indicate the warning should be paid attention.

Low priority: indicate the finger off or finger sensor off.

Alarm of this oximeter includes technical and physiological alarm. All three priorities divided by built-in module and can not be changed by user.

VISUAL ALARM INDICATORS:

If the alarm is activated through over limitation of physiological alarm, corresponding data will be flashing. If the alarm is activated by more than one physiological alarm, each parameter will be displayed with flashing.

AUDIBLE ALARM INDICATORS:

Audible alarms can be heard if there is no silence. The audible alarm has different tone pitch and on-off beep patterns for each alarm priority.

High priority: "du-du-du-----du-du", beeps every 8 seconds.

Medium priority: "du-du-du", beeps every 5 seconds.

Low priority: "du-", beeps every 5 seconds.




Assignment of priority:

SpO₂: High priority







PR and battery low: Medium priority

Other information: low priority

8.2 Alarm Setting

In the main menu screen, press the  or the  button to select the "Alarm Set" item, and then press the  button to enter into the sub menu.

You should input the password firstly. The password is 2222.

1. Press the  or  button to select the item.
2. Press the  button to confirm the selection.
3. Press the  or  button to increase/decrease the data
4. Press the  button to confirm

After input the password correctly, you can enter into the alarm set screen.

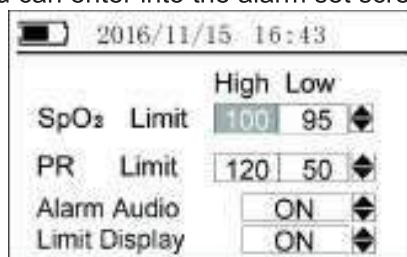








Fig.8.1

1. Press the  or  button to select the item.
2. Press the  button to confirm the selection.
3. Press the  or  button to increase/decrease the data or change the mode.
4. Press the  button to confirm

Alarm limits setting range:

SpO₂: Upper alarm range: 71-100 The default SpO₂ upper alarm is 100.

Low alarm range: 70-99 The default SpO₂ low alarm is 95.




PR: Upper alarm range: 31-235 The default PR upper alarm is 120.

Low alarm range: 30-234 The default PR low alarm is 50.

Note: When the device is turned off, the alarm limits of the last time set are restored, when the device is turned on, you should set alarm limits again if necessary.

CHAPTER 9 Printer Settings

The monitor can print data when used with a printer.

In the main menu screen, press the  or the  button to select the "Printer Settings" item, and then press the  button to enter into the sub menu. Refer to the Fig.9.1

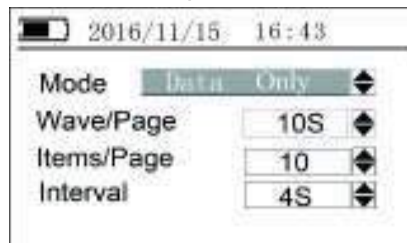









Fig.9.1

1. Press the  or  button to select the item.
2. Press the  button to confirm the selection.
3. Press the  or  button to increase/decrease the data or change the mode.
4. Press the  button to confirm

Print mode: There are two print modes for selection.

Data & Wave: If you select this printing mode, when you press the  button in the measuring screen, the printer firstly print the real-time data records and then print the real-time waveforms.

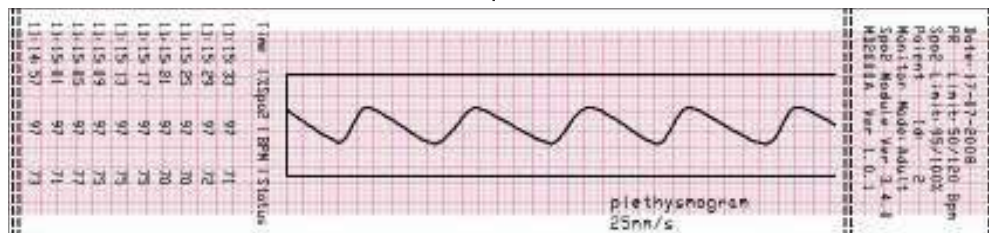


Fig.9.2

Data Only: when you select this printing mode, the printer will print the data records only.



Time	SpO2	PRN	Status
11:15:30	97	71	
11:15:29	97	72	
11:15:28	97	70	
11:15:27	97	70	
11:15:26	97	73	
11:15:25	97	73	
11:15:24	97	73	
11:15:23	97	73	
11:15:22	97	73	
11:15:21	97	71	
11:15:20	97	71	

Fig.9.3


Wave/Page: You can set the waveform's length of per printing page. The setting range is: 5s-30s.

Items/Page: You can set that how many records are printed in one printing page. The setting range is from 10 to 255.

Interval: You can select the printing interval by this item. The setting range is from 4s to 60s.

CHAPTER 10 Net Connection (optional)

The monitor can connect with our central monitoring systems. If the customer select the Net function.

In the main menu screen, press the ▲ or the ▼ button to select the “Net Connect” item, and then press the  button to enter into the sub menu. Refer to the Fig.10.1

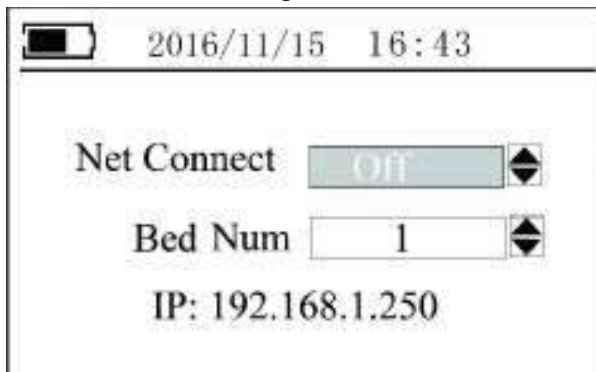





Fig.10.1

Net connect setting: Press the  button to select different item to set up. And then press the ▲ or ▼ button to set the net connect on or off.

ON: The net connection is on.

Off: The net connection is off.

Press the  button to return to the previous menu.

Bed No. settings: Press the  button to select the “Bed No.” item, and then press the ▲ or ▼ button to change the bed number. Press the  button to return to the previous menu. The setting range of the Bed number is 1 to 99.

CHAPTER 11 Trouble shooting

Problems	Possible reason	Solution
SpO ₂ % or pulse rate can not be shown normally	1.Finger is not plugged correctly 2. Patient's SpO ₂ value is too low to be measured	1.Retry by plugging the finger 2. There is excessive illumination 3. Measure more times, If you can make sure about no problem existing in the product. Please go to a hospital timely for exact diagnosis
SpO ₂ % or pulse rate is shown unstably	1. Finger may not be plugged deep enough 2.Excessive patient movement	1. Retry by plugging the finger 2. Be calmness.
The Monitor can not be powered on	1.No battery or low power of battery 2.Battery might be installed incorrectly 3. The Monitor might be damaged	1. Please replace battery 2. Please reinstall the battery 3. Please contact with local customer service center
Displaying screen can not be refreshed	1.CSN604 SpO ₂ module damaged 2. Hang	1. Contact with local customer service center 2. Re-power on (cut off the AC power and fetch out DC battery)
Data storage failure	The ID number is zero The memory is damaged	Set the ID number in range of "1~99" Please contact with the local customer service center
Printing failure	1. Low power 2. Wrong operation	1. Please change the battery or adopt the AC power supply 2. Please refer to the instruction manual for printing.
Net connection failure	1. The net connect mode is off in the "Net connect "menu. 2. Wrong connection of the network cable or cable connection badness.	1 Please set the net connect mode as "ON" 2 Re-connect the cable or change another cable.

12.1 Maintenance

- Ammonia (diluted),
- Glutaraldehyde,
- Sodium hypochlorite bleach (diluted)
- Mildness suds (diluted).

Field inspecting: we will send engineers to repair the instrument if necessary. Certified engineers of our company or local repair team trained by our company provide this service.

Fittings replacement: if necessary, we will replace the damaged fittings according to contract. The damaged fittings should be returned to us except for special reason.

(3) Spare machine for repair: it is used to replace the damaged machine for customer using, customer should send the damaged machine to us to repair.

(4) Repair for sponsoring and contributing machine: customer should send the machine to us to repair.

(5) Updating software is free.

12.2.2 Exemption and restriction:

(1) Warranty does not apply to the damage or loss sustained due to well-known act of god, such as fire, earthquake, flood, thunder, cyclone, hail, electrical storm, blast, building collapse, commotion, etc.

(2) Non-service items:

① The cost and insurance of dismantling and testing, overhauling, reinstall, transfer, moving the instrument or parts.

② Damage or loss sustained due to inspected or repaired by other institute that is not certified

③ Damage or alteration by anyone else who are not our company authorized service personnel.

(3) The damage or lose sustained due to connection to peripheral equipment (such as printer, computer etc.), that are not provided by our company are not covered by the warranty.

(4) Obligation restriction: In the duration of warranty, if the operators use other fittings that are not provided by us, we reserve the right to cancel warranty.

12.2.3 Customer guarantees:

(1) Read the user manual carefully before operation.

(2) Operation and maintenance according to the user manual, and guarantee the requests of power and environment.

12.2.4 Non-warranty and Non-replacement Policy

- The work environment is not eligible. For example, if the relative humidity exceeds 70%, circuit boards of the instrument may be damaged due to condensate.

- If voltage of power supply is fluctuant and exceeds 240VAC, the power adapter may be damaged.

- There is smear or marks that are not belong to the instrument and cannot be removed from the outside surface of the instrument.

- The instrument or its fittings are mechanically damaged.

- The circuit is short and damaged due to liquor or other stuff flow in the instrument or its fittings.

- All probes and accessories are not free replacement.

- Leakage of air cell of blood pressure sleeve due to improper storage or operation is not free replacement.

- The malfunction with result from improper repair by anyone other than our company authorized service personnel.

- The malfunction with result from improper use.

12.2.5 Customer special warranty period

We stipulate the warranty period according to the relevant electronic regulation of country, the unit's warranty period is one year and the accessory's is three months. When customer requires to extending the warranty period, you should consider whether it is reasonable. As the electronic product's quickly replacing speed, if the warranty period over three years, purchased accessories may be out of stock. In this case, we will adopt to entirely upgrade or replace the old, you should pay the minimum acceptable cost of renewed device.

12.2.6 Repackaging

Remove all the detectors, leads and accessories and put them into the plastic bag.

Try to use the original packaging case and materials. Any damage due to the improper packaging during the transportation shall be responsible by the user.

If you are still within the period of warranty, please present the warranty card and one copy of the invoice or receipt.

Please present a written note detailing all the troubles when repairing the instrument.

CHAPTER 13 Components

List of components

The components list below is specified to be used in this device of our company. The user can order the various components according to the hospital requirements.

The standard components:

No.	components	Quantity
1	SpO ₂ probe (for adult) M-50A	1 piece
2	Power cable	1 piece
3	Grounding wire	1 piece
4	Operator's manual	1 piece
5	Battery Pack	1 piece
6	Screwdriver	1 piece
7	USB data cable	1 piece

The optional components:

No.	components	Quantity
1	SpO ₂ probe (for Pediatrics M-50B)	1 piece
2	Thermal array recorder	1 group
3	Data upload software	1 piece
4	Module and accessories for connection with the central station	1 group

CHAPTER 14 Declaration

Guidance and manufacturer's declaration - Electromagnetic emission---- for all EQUIPMENT AND SYSTEM


1	Guidance and manufacturer's declaration- electromagnetic emission		
2	The model VPOD Vital Pro is intended for use in the electromagnetic specified below. The customer or the user of the model VPOD Vital Pro should assure that it is such an environment.		
3	Emissions test	Compliance	Electromagnetic environment-guidance
4	RF emissions CISPR11	Group 1	The model VPOD Vital Pro 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 VPOD Vital Pro is suitable for use in all establishments, including domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
5	RF emissions CISPR11	Group B	
6	Harmonic emissions IEC 61000-3-2	Not Applicable	
7	Voltage fluctuations/ IEC 61000-3-3	Not Applicable	

Guidance and manufacturer's declaration - Electromagnetic Immunity- For all Equipment and Systems

Guidance and manufacturer's declaration- electromagnetic immunity			
The model VPOD Vital Pro is intended for use in the electromagnetic environment specified below. The customer or the user of the model VPOD Vital Pro should assure that it is used in such an environment.			
Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment-guidance
Electrostatic discharge(ESD) IEC 61000-4-2	±6kV contact ±8kV air	±6kV contact ±8kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.

Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3A/m	3A/m	Power frequency magnetic fields should be at levels characteristics of a typical location in a typical commercial or hospital environment.
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**Guidance and manufacturer's declaration- electromagnetic immunity-
For EQUIPMENT and SYSTEM that are not LIFE-SUPPORTING**

Guidance and manufacturer’s declaration – electromagnetic immunity			
The model VPOD Vital Pro is intended for use in the electromagnetic specified below. The customer of the user of the VPOD Vital Pro should assure that it is used in such an environment.			
Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment-guidance
Conducted RF IEC 61000-4-6	3Vrms 150kHz to 80MHz	3V	Portable and mobile RF communications equipment should be used no closer to any part of the model VPOD Vital Pro , including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance $d=1.2\sqrt{P}$ $d=1.2\sqrt{P}$ 80MHz to 800MHz $d=2.3\sqrt{P}$ 800MHz to 2.5GHz Where P is the maximum output power rating of the transmitter in Watts (W) according to the transmitter manufacture and d is the recommended separation distance in meters (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey,a should be less than the compliance level in each frequency range.b Interference may occur in the vicinity of equipment marked with the following symbol: 
Radiated RF IEC 61000-4-3	3V/m 80MHz to 2.5GHz	3V/m	
NOTE1 At 80MHz and 800MHz, the higher frequency range applies. NOTE2 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 station 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 model VPOD Vital Pro is used exceeds the applicable RF compliance level above, the Vital sign monitor should be observed to verify normal operation. If abnormal performance is observed, the additional measures may be necessary, such as reorienting or relocating the model VPOD Vital Pro monitor.
- b. Over the frequency range 150kHz to 80MHz, field strengths should be less than 3V/m.

Recommended separation distances between portable and mobile RF communications equipment and the EQUIPMENT or SYSTEM-for EQUIPMENT and SYSTEMS that are not LIFE-SUPPORTING

Recommended separation distances between portable and mobile RF communications equipment and the VPOD Vital Pro

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

Rated maximum output of transmitter(W)	Separation distance according to frequency of transmitter (m)		
	150KHz to 80 MHz	80MHz to 800 MHz	800MHz to 2.5 GHz
	$d=1.2\sqrt{P}$	$d=1.2\sqrt{P}$	$d=2.3\sqrt{P}$
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 transmitters rated at a maximum output power not listed above, the recommended separation distance in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

NOTE1 At 80MHz and 800MHz, the separation distance for the higher frequency range applies.

NOTE2 These guidelines may not apply in all situations. Electromagnetic interference is affected by absorption and reflection from structures, objects and people.