RNpet 100

Handheld Vital Signs Monitor

Operator's Manual

Attention： Before operating, please read this

Manual carefully. Please keep this Manual properly for future reference.

Product Name: Handheld Vital Signs Monitor

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Chapter I Overview

1.1 Introduction

The RNpet 100 is mainly used to measure blood pressure, Spo2, temperature and pulse rate. This monitor is suitable for animal, and could be applied in general ward, including, but not limited to, ICU, CCU or ambulance, and so forth.

WARNING	This equipment must be operated by professional clinical doctor or trained healthcare professionals. Personnel who is not authorized or trained cannot do any operations for monitoring procedure.

NOTE	The illustrations in this manual may be slightly different than actual device due to device revision.

Safety

Degree of protection against electric shock: Type BF Applied.

The RNpet100 is suitable for animal: vital signs monitoring. Under the spot measurement mode, it stores up to 100 users' data (200 records for each users). Under the monitoring mode, it stores 48 hours of measurement data, with a friendly interface, 3.5" color TFT screen, data review functions, including data listing, data trend chart.

Under audio and visual alarm mode, the red light flashes when power is low. When measuring data beyond the alarm limit, the font of the result data becomes red with audio alarm. The user can turn on or off alarms per needs.

⚠ **Note** ⚠

The device will shut off itself automatically under spot measurement mode within 3Min of no measuring operating.

Chapter Ⅱ Main parts & accessories

2.1 Button and indicator light



Fig. 2.1.1 button and indicator light

- Power switch

  Switch on/off

- Mute

Press this key to suspend or resume the alarm loudspeaker

- Function 1

Carry out functions as indicated by text showing on the lower left corner of screen

- Function 2

Carry out functions as indicated by text showing on the lower right corner of screen

- Select

Choose different options on setting menu

- Alarm light

Red light flashes when alarm

- Power light

Red light flashes when charging or in low power. Green light flashes when fully charged. No flashing under normal conditions.

2.2. Power socket

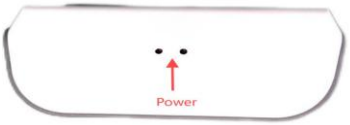


Fig. 2.2.1 power socket

Note

Please use the power adapter offered by GOLDCARE only. Don't use device while charging.

2.3. Reset button



Fig. 2.3.1 reset button

Open the protecting shell, and plug a needle into the reset hole. Press hard, the device will be reset.

Note

USB function is not offered in current version.

2.4. Ports

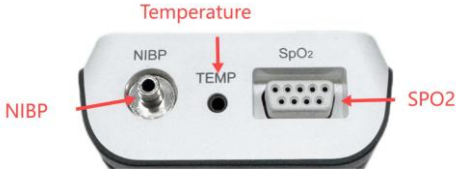


Fig. 2.4.1 ports

2.5. Mounting hole



Fig. 2.5.1 mounting hole

Note

Mounting hole is used with accessories from other manufacturers such as accessories on stand of infusion pump.

2.6. Accessories

A. Animal sleeve 1-5

B. NIBP extension hose, 1 pc

C. Spo2 sensor, 1 pc

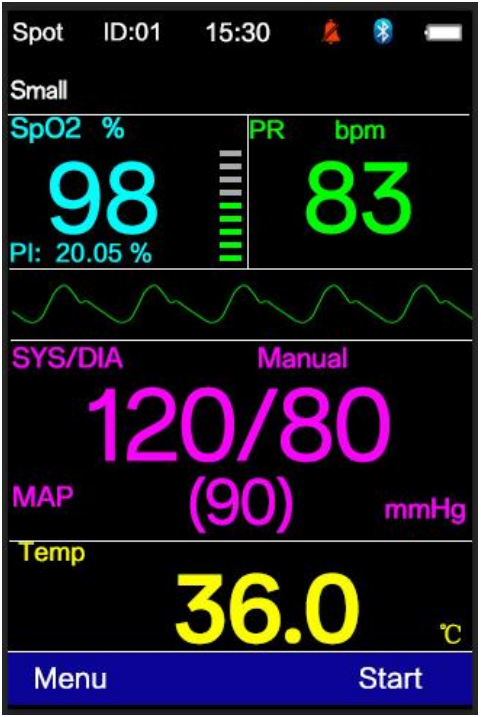
D. Temperature probe, 1 pc

E. Power adapter, 1pc

F. User manual, 1pc

Chapter Ⅲ Interface

3.1 Main interface



⚠ **Note** ⚠

After the internal memory is full, the earliest records will be overwritten.

3.2 NIBP Measurement Interface

When measuring NIBP, the MAP bar displays real-time blood pressure data and current measurement information.

3.3 NIBP Measurement Result Interface



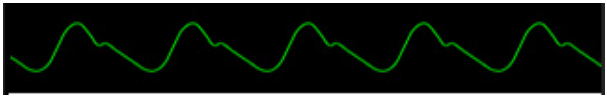
If there is blood pressure measurement error, device shows error code on the screen.

⚠ **Note** ⚠

When Spo2 sensor is plugged in, the pulse rate is from the Spo2 calculation; otherwise the pulse rate is from blood pressure calculation.

3.4 Spo2 Measurement Interface





3.5 Temperature Measurement Interface



3.6 System menu

Turn on the device, press “Set” button to enter the system setup menu.

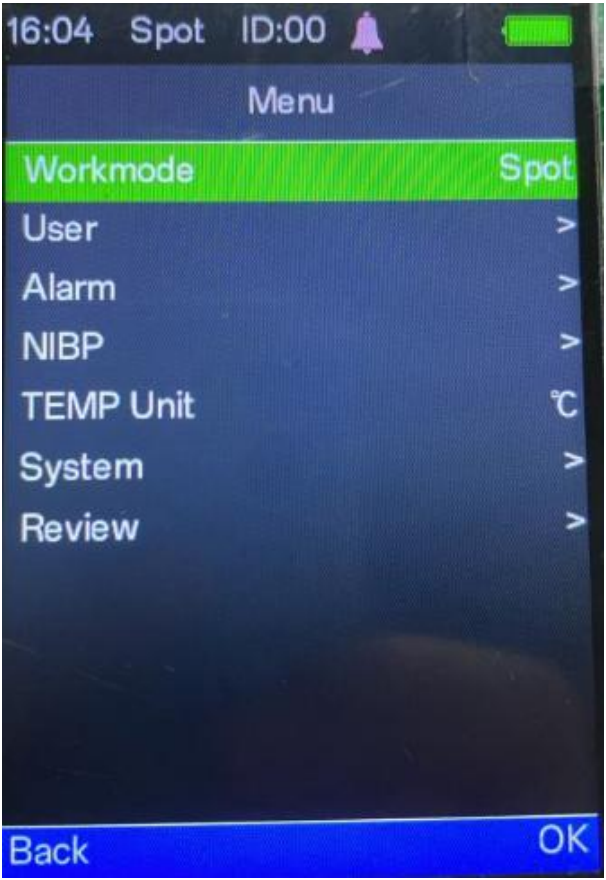

16:04 Spot ID:00
Menu
Workmode Spot
User >
Alarm >
NIBP >
TEMP Unit ℃
System >
Review >
Back OK

Fig. 3.6 System menu

3.6.1 Work mode Setup:

SPOT & Monitoring mode

Under spot mode, the device will shut off automatically with no measuring operating within 3Min, otherwise the results are recorded once every 30 seconds.

Under Monitoring mode, the device works continuously, the results are recorded once every 2 seconds.

3.6.2 NIBP setup

Measure Mode：Manual, Auto, Stat

Patient Type：Big,Small

Pressure unit：mmHg, KPa

Measuring Interval: measuring interval can be set under AUTO Mode,

3.6.3 Temperature unit：℃，℉

3.6.4 Alarm setup：Set the alarm limit of each parameter

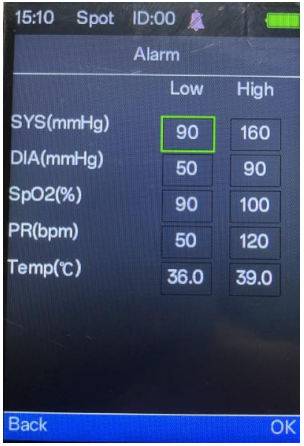


Fig.3.6.4 Alarm

SYS alarm range： 40～200mmHg

DIA alarm range： 10～165mmHg

Spo2 alarm range：100%~0%

Temperature alarm range：45~18℃

Pulse rate alarm range：0～500BPM

3.6.5 System set up：System Parameters Set Up

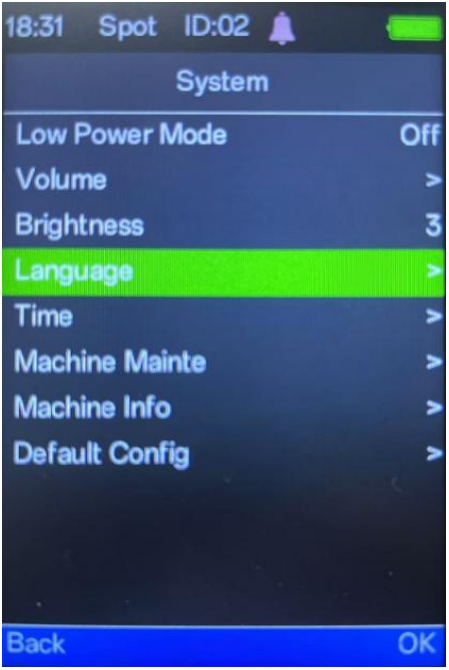
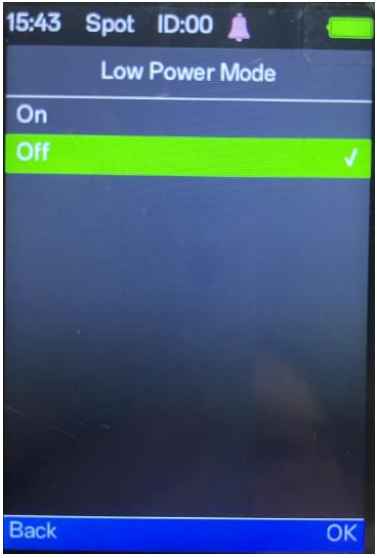


Fig. 3.6.5 system setup

Low Power Mode：

Under SPOT mode and low power mode is on, the device will shut off automatically with no measuring operating within 3Min. If the low power mode is off, it will not shut off.



⚠ **Note** ⚠

Under monitoring mode, Low Power Mode is

unavailable.

Bluetooth: On/Off

⚠ **Note** ⚠

The Bluetooth function is not available in current version of device.

Language: English, Chinese

Brightness: Level 1,Level 2

Time: Adjustable

Set ID(under Spot mode): select ID, New ID, Delete ID

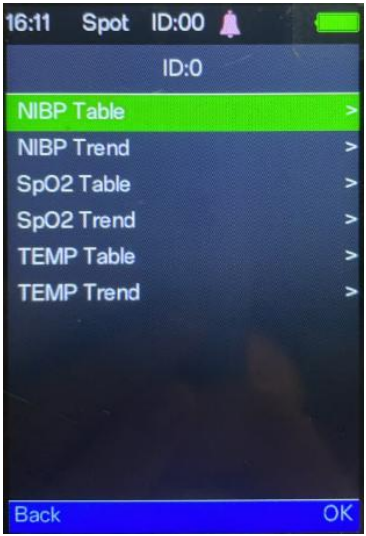
Default Configuration:

To Restore the Default Factory Settings

Machine Maintenance: password “0000”

Machine Information: Version No.

3.6.6 Review: Measurement Results Review



Choose “OK”, System will return to “Review” Menu:

Fig.3.6.6 Review Menu

3.6.6.1 Table

NIBP Table：Time，SYS，DIA，PR

Spo2 Table：Time，SPO2，PR

Temperature Table：Time，TEMP

3.6.6.2 Trend Chart

NIBP Trend Chart

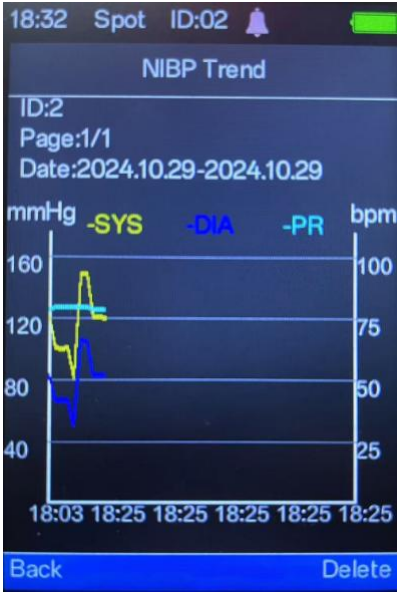


Fig.3.6.6.1 NIBP Trend Chart

The trend chart shows SYS, DIA and Pulse rate by different color, the left vertical axis represents the NIBP, the right vertical axis represents the pulse rate. The

horizontal axis represents time, the trend chart includes ID, Pages, Date(time range in this page), to view all the data through all the pages.

Spo2 Trend Chart

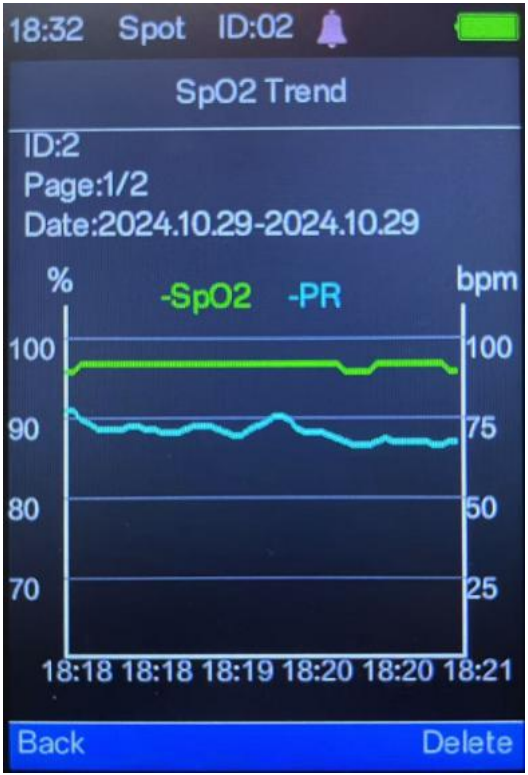


Fig.3.6.6.1 SpO2 Trend Chart

The spo2 trend chart displays spo2, pulse rate, the left vertical axis is oxgen saturation in percent, the right vertical axis is pulse rate, the horizontal axis is the measurement time.

Temperature Trend Chart

The temperature trend displays temperature data, the unit is either Fahrenheit or Celsius.

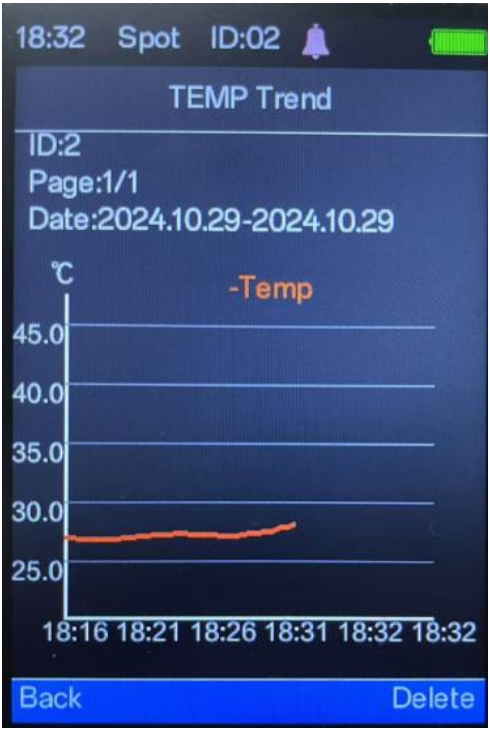


Fig.3.6.6.2 Temperature Trend Chart

Chapter Ⅳ NIBP Measurement

4.1 General

- NIBP monitoring adopts oscillometry technology；
- Measurement mode: manual, auto
- Measure systolic, mean , diastolic blood pressure and pulse rate
- Applies to : animal；

Warning

- Do not measure NIBP on animals with sickle-cell disease or with any skin damage.
- Animal with severe blood flow problems, or blood disorders, should consult physician before using the device, as the arm cuff inflation may cause bruising.
- Select the correct animal type.

4.2 NIBP measurement

Warning: Make sure inflatable hose connect with the

cuff and the monitor, and the hose is not folded or twisted.

1. Insert the inflatable hose into the NIBP socket.

2. Tie the blood pressure cuff on the animal's limb

- Make sure that the cuff is completely deflated.
- Adjust an appropriate cuff size for the animal, and make sure that the symbol "**φ**" exactly on the appropriate artery. Ensure that the cuff is not wrapped too tightly. Otherwise, it may even cause ischemia.

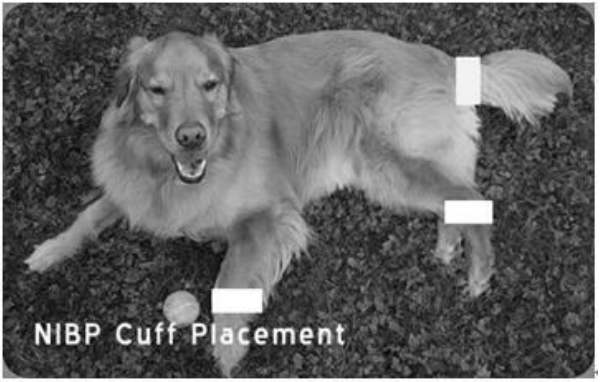


Fig. 4.2.1 Cuff usage

Note

The width of the cuff should be either 40% of the limb circumference or 2/3 of the upper arm length. The inflatable part of the cuff should be long enough to encircle 50-80% of the limb. The wrong size of cuff can cause erroneous readings.

Big animal reusable NIBP cuff:

Patient type	Circumferenc	Cuff width	Hose
---	---	----	1.5m or 3m
Big 1	18～26cm	10.6cm	
Big 2	25～35cm	14cm	
Big 3	33～47cm	17cm	
Big4	46～66cm	21cm	

Small disposable NIBP cuff:

Size	Circumference	Cuff width	Tube length
1	3～6cm	2.5cm	1.5m or 3m
2	4～8.0cm	3.2cm	

3	6～11cm	4.3cm	
4	7～13cm	5.1cm	
5	8～15cm	5.5cm	

Make sure that the cuff size is within the range.

3. Connect the cuff and the inflatable hose. The chosen limb for taking the measurement should be placed at the same level as the animal's heart. You can adjust the measurement results as below:

- If the cuff is placed higher than the heart level, add 0.75mmHg (0.10kPa) per each centimeter gap.
- If it is placed lower than the heart level, deduct 0.75mmHg (0.10kPa) per each centimeter gap.

4. Check the correct NIBP measurement mode that is suitable for your patient type.

5. Press button function 2 to start testing

4.3 Operation Instruction

1. Perform Automatic measurement

User can set the measurement interval time to start automatic measurement. System will work according to the interval time.

2. Stop automatic measurement

During automatic measurement, press the STOP button to stop measuring, system will start next automatic measurement after 30s.

3. Perform manual measurement

◆ Press the “Start” button to start the manual measurement

◆ During the non-working time of the automatic measurement, press the Start button can start manual measurement. If press the Stop button later, the system will stop manual measurement and continue automatic measurement.

⚠ **Warming** ⚠

◆ If liquid spilled on the monitor or accessories, especially when liquid enters into the monitor, please stop using the vital sign monitor and contact related service personnel.

◆ According to the animal situation, oscilloetric measurement has some limits. This measurement method requires to find the regular pulse waveform generated by the arterial pressure. The following situations may cause a longer measurement time or unreliable values:

◆ Moving

◆ Arrhythmia

◆ Artificial heart-lung machine

◆ Quick Pressure Change

- Severe shock
- Limited heart rate
- Obese patient

◆ 4.4 NIBP error and possible cause of error

Error	Cause
SysErr	Self-test fail
SysErr2	NIBP module system error
CuffLoose	cuff is too loose or cuff not connect
CuffErr	Use small cuff under big animal mode
Leakage	valve or gas circuit leak
PressErr	NIBP Valves is not working appropriately
Weak	Animal’s pulse is too weak or cuff is loose
OverRange	animal’s blood pressure exceeds the measurement range

Motion	During measurement, motion artifact in signal or too much interference
Protect	Cuff pressure exceeds the range, 300mmHg
Saturate	Too large signal amplitude caused by motion or other reasons
TimeOut	BIG animal: cuff pressure over 2kPa（15mmHg）last for more than 3minutes Small animal: cuff pressure over 0.67kPa（5mmHg）last for more than 90s

Reset	NIBP module reset

4.5 Maintain and Clean

⚠ **Warming** ⚠

- **Don’t press the rubber hose**
- **Don’t make the cleansing liquid into the vital sign monitor and the charge dock, which may damage the monitor**
- **When cleaning the monitor, only wipe the case**

Disposable NIBP Cuff

Disposable NIBP cuff can be used for only one animal, it can not be disinfected or be sterilized under high

pressure steam.

Chapter Ⅴ SpO2 Measurement

5.1 Measurement Parameters

Arterial oxygen saturation(SpO2): Oxyhemoglobin percentage of total hemoglobin

Pleth waveform（Pleth）: animals pulse signal Pleth waveform

Pulse Rate: pulse per minute

Index bar: in proportion to the pulse strength

Blood flow perfusion index: PI values reflect the situation of pulsatile blood flow,which reflect the ability of blood flow perfusion. The larger the pulsation of the blood flow, the higher the PI value.

5.2 Measurement instruction

Animal SPO2 sensor

1) connect the SPO2 sensor appropriately

2) Press the power button to turn on the monitor

3) Put the animal's tongue into the SPO2 sensor appropriately

5.3 ⚠ Cautions⚠

1) Must use the SPO2 sensor shipped with the monitor

2) The SPO2 sensor should be on the tongue or ear to ensure the tongue cover the light from the sensor

3) Keep the SPO2 sensor stable to get accurate measurement results

4) When the SPO2 sensor or the patient is moving, the measurement results is not accurate

5) Check all the cables and make sure the SPO2 sensor in good condition

6) After measuring, remove the SPO2 sensor from the animal immediately

7) Don't use the monitor when the animal's pulse rate is lower than 25BPM, otherwise, it may give incorrect values

8) Don't reuse a disposable SPO2 sensor

9) During long time monitoring, every 2-3 hours, you should check if the tongue and the SPO2 sensor touch appropriately.

10) Keep measured tongue clean, otherwise, it may influence the accuracy of the SPO2 measurement

11) Sterilize the SPO2 sensor before measuring different animal

5.4 SPO2 Error and SPO2 Possible Cause of error

Error	Cause
SysErr3	SPO2 module self-test error
SysErr4	SPO2 module communication
no pulse	Can’t find pulse
no Sensor	SPO2 sensor not connected
Sensor off	No tongue in sensor
Searching	Searching pulse

Chapter Ⅵ Temperature Measurement

6.1 Connection Mode

For reusable TEMP probe, just plug it in to the TEMP probe socket. Put the TEMP probe on the animal's anus appropriately.

Maintain and Cleaning

⚠ Warming⚠

Turn off the device and disconnect the AC power before cleaning the device or probe.

Reusable TEMP probe

1. Temperature of the probe shall not exceed 100 ℃ (212 ℉). It can only bear 80℃（176℉）~100℃（212℉）for very short time.

2. Do not use steam sterilization.
3. Only accept detergent with alcohol sterilization

6.2 TEMP Error and Possible Cause of error

Error	Cause
SysErr5	TEMP module self-test/communication err
Overrange	Beyond the measurement range

Chapter Ⅶ Specifications

Equipment Classification (IEC 60601-1)

According to the type of protection against electric shock: Class II (on AC power) internally powered (on battery power)

According to the degree of protection against electric shock: Type BF Applied

Display: 3.5" Color TFT

Dimension: 146mm*67mm*30mm

Weight: 250g with rechargeable battery

Working Environment：

Temperature

Operating: 5ºC～ 40ºC

Storage/Transportation: -20ºC～+55ºC

Humidity

Operating:15%～80%

Storage/Transportation:≤ 95%

Altitude

700hPa~1060hPa

Power

4V, DC

P≤3.2VA

NIBP

Measuring Technology: Automatic oscillometry technology

Mode: Manual, Auto, Stat

Measuring Interval in AUTO Mode: 1 ~ 90 (Min)

Measuring Interval in Continuous Mode: 5 (Min)

Pulse Rate Range: 40 ~ 240 (bpm)

Alarm: SYS, DIA, MEAN

Measuring Range:

SYS 40 ~ 270 (mmHg)

MEAN 20 ~ 230 (mmHg)

DIA 10 ~ 210 (mmHg)

Resolution

Pressure 1mmHg

Accuracy

Pressure

Maximum Mean error ±5mmHg

Maximum Standard deviation 8mmHg

Over-pressure Protection

300 (mmHg)

Alarm Limit Setting

SYS 40～280 mmHg

DIA 10～220 mmHg

Measurement Range:

Spo2: 0～100%

PR：0-500bpm

Perfusion Index: 0.05%-20%

Accuracy range

SpO2：70%-100%

PR：30-500bpm

Perfusion Index: 0.05%-20%

Measurement accuracy

SpO2:

±3digits（70-100％）　　undefined（<70%）

On motion condition: ±3digits

Pulse rate:

±3digits

On motion condition: ±3digits

Alarm Range：0%~100%

Temperature

Range: 25 — 45°C

Resolution: 0.1°C

Accuracy: ±0.1°C

Power Source

AC power or battery

AC power:

100-240VAC, 50/60Hz, 30VA

Fuse(self-recovery):

Input fuse: 2A/250V

Fuse (battery): 60Vdc/3A(max)

Battery

Lithium ion rechargeable battery: 3.6V/4.2Ah

Work time: 8hours

Charge time: 6hours