

# Infrared Thermometer

## Operation Manual

### Introduction

Sincerely thank you for choosing Penrui Infrared Thermometer.

Please read this manual carefully in order to ensure correct use of the device. After carefully reading this manual, please keep it safely stored so that you can refer to it when necessary.

**Product Name:** Infrared Thermometer.

**Model:** JRT200

**Product Composition:** The infrared thermometer is mainly composed of a detector, buttons, screen, battery cover and body.

**Scope of Product Application:** It is suitable to measure the temperature of the object by measuring the heat radiation of the forehead.

**Manufacturer,** Penrui Biotech Inc.

**Registered Address:** Room 201/203/204, Building 12, Xinggong Technology Park, #100 Luyun Road, Changsha, China

**Date of Manufacture:** See the label of the instrument

**Manual Preparation Date:** February 20, 2020

**Manual Revision Date:** March 13, 2020

**Item No.:** L00.2020031204

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Penrui reserves the right to change technology without prior notice.

Penrui reserves the right to modify product specifications without prior notice.

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### Statement

Only when meeting all the following requirements, Penrui considers it responsible for the safety, reliability and performance of the product:

1. Assembly operations, expansions, readjustments, improvements and repairs are performed by professionals approved by Penrui.
2. All the repair-related parts, accessories and consumables used in the repair are original or approved by Penrui.
3. The relevant electrical device complies with national standards and the requirements of this instruction manual.
4. Operation is performed according to this instruction manual.

### Customer Service Department

**Manufacturer:** Penrui Biotech Inc.

**Address:** Room 201/203/204, Building 12, Xinggong Technology Park, #100 Luyun Road, Changsha, China

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## Chapter 1 Safety and Precautions

Knowing the body temperature of a healthy person will help determine whether a person has a fever. To know the normal body temperature of a person, please take multiple measurements when healthy.

### 1.1 Warning

- Do not allow children under 12 years of age to touch the infrared thermometer alone.
- Do not use the infrared thermometer for non-intended purposes.
- The infrared thermometer is not waterproof. Do not immerse it in water or other liquids.
- Do not store the infrared thermometer in extreme environments.
- The person being tested must stay indoors for 30 minutes before measuring body temperature (the person and the infrared thermometer should be at the same ambient temperature for at least 30 minutes)
- When measuring in sound mode, keep the infrared thermometer and forehead at a distance of 0 to 2.5 cm. Do not move the infrared thermometer until a beep sound.
- If the infrared thermometer or its detector is damaged, do not continue using it, do not repair it by yourself, and do not insert sharp objects into the detector or other openings.
- Infrared thermometer is not a substitute for physician diagnosis.
- Infrared thermometer is not suitable for premature infants or infants under gestational age.
- Do not take a baby's temperature immediately after breastfeeding.
- Do not allow children to take their own temperature without supervision.
- Try to measure in the same area. Different temperature may be obtained in different areas.
- Do not hold the detector during the measurement.

### 1.2 Precautions

- After waking up, it is recommended to wait for a few minutes before measuring temperature.
- The person being tested should not eat, drink or perform other physical activities before or during measurement. If wearing a hat, remove it and wait for 10 minutes before taking a temperature
- Clean up the dirt or hair on forehead before measuring temperature. Bangs may increase readings. Wait 10 minutes after washing your forehead before taking temperature.
- Take your temperature strictly according to the instructions. If not placed properly, body temperature readings may be affected.
- If patients use the infrared thermometer to take their own temperature, it's recommended to use contact method to measure.
- Follow the instructions in the "Cleaning and Maintenance" section for cleaning.
- The infrared thermometer contains high-quality precision parts. Do not drop it and avoid severe shocks and vibrations. Do not twist the infrared thermometer or detector.
- Seek medical attention as soon as possible if having unexplained irritability, vomiting, diarrhea, dehydration, changes in appetite or behavioral patterns.
- Pay attention to the storage and use conditions in the "Product Specifications" chapter. Infrared thermometer should be protected against dirt and dust.

### 1.3 Contraindications

None















### 1.4 Environmental protection

The company designs and manufactures infrared thermometers according to the requirements of safety and environmental protection. This product will not cause any harm to people or the environment if any casing of the product is disassembled or always used correctly. If permitted by law, materials that may be harmful to the environment must be disposed of in the correct manner.

#### **⚠Warnings:**

- Do not dispose of the product with industrial or household waste.
- According to the requirements of local and national environmental regulations, the waste generated by the product and the disposed product when it reaches its service life should be treated in a correct way.
- Reusable materials can be recycled by qualified waste disposal companies to reduce environmental pollution.
- For related matters, please consult the company's service agency, or properly dispose of them according to the methods of local garbage collection facilities.

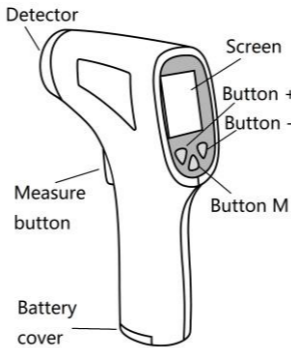
### 1.5 Symbols

Symbols	Meanings	Symbols	Meanings
	Warnings		BF type application part
	Serial number		Manufacturer
	Keep dry		Upwards
	Temperature limit		Fragile, handle with care
	Humidity limitation		Manufacturing date
	Atmospheric pressure limitation		Refer to operation manual
	This product contains certain toxic and hazardous substances. The environmental protection use period is 20 years. It can be used safely during the period. When the period is exceeded, it should be recycled.		Waste disposal symbol. This symbol indicates that the waste cannot be disposed of as unsorted municipal waste and must be recycled.

## Chapter 2 Description

### 2.1 Structure and components

The infrared thermometer is comprised of detector, buttons, screen, battery cover and the body.



### 2.2 Key components

NO	Component	NO	Component
1	Sensor	2	MCU

### 2.3 Packing list

Part	Qty	Replacement	Cycle
Operation manual, certificate, warranty Card	1	/	/
1.5V AAA battery	1	Refer to chapter 3.5	Refer to chapter 3.5
Infrared thermometer	1	/	/

The product should contain the above items. If missing, please contact the company or the distributor immediately.

## Chapter 3 Installation and Use

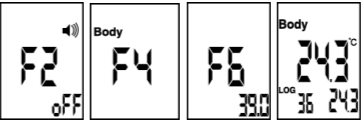
### 3.1 Inspection

Before unpacking, please check the package carefully. If you find any damage, please contact the shipping company immediately. Unpack the package in the correct way, carefully take out the infrared thermometer and other components from the box and check according to the packing list.

When the device is transferred to another place, condensation may occur on the device due to differences in temperature or humidity. Please wait for the condensation to disappear before using the product.

### 3.2 Button and setting

Press the Measure button to turn on the device when it is off. The device will perform a self-test when it is turned on. After the self-test is completed, the device displays and beeps. If the self-test fails, the machine displays a self-test failure.



#### **Setting**

- 1) F2: sound setting, press button + or - to turn on the sound (ON) or turn off the sound (OFF).
- 2) F4: mode setting, press button + or - to switch to surface temperature or body temperature mode.
- 3) F6: Alarm setting, press button + or - to set the alarm temperature.

Steps: After turning on, press the button M to start setting, press the Measure button to switch the setting, press button + or - to set respectively, and press the button M to save the setting and enter the measurement interface.

#### **Review**

In the measurement interface, press Button + or - to view the historical results.

**Note:** The body temperature is different from the surface temperature. Body mode measures the body temperature, and Surface temp mode measures the surface temperature of the object for calibration purposes. When measuring body temperature, make sure to select Body mode.

### 3.3 Measuring

- 1.After starting up, align the detector with the center of the forehead (above the eyebrow center) and keep it vertical, keeping a distance within 2.5cm (do not directly touch the skin).
- 2.Press the Measure button, and the thermometer starts to measure.
- 3.After the measurement is completed, the screen displays the body temperature.

#### **⚠Notes:**

- If the measurement is lower than 35.0 °C, the screen displays Lo and continuously beeps
- If the measurement is higher than 42.0 °C, the screen displays HI and continuously beeps.
- If the measurement is higher than the set alarm temperature, after the measurement is completed, it continuously beeps.

### 3.4 Shutdown

The thermometer automatically shuts down if no operation.

### 3.5 Install or replace the battery

After opening the package, install the battery firstly. The battery holder is located at the bottom of the infrared thermometer. Install or replace the battery as follows:

1. Open the battery cover.
- 2.Insert the battery and make sure that the + and - poles of the battery fit the battery holder.
- 3.Close the battery cover.

#### **⚠Notes:**

1. Please use 2 AAA alkaline batteries
- 2.Please use the same type of battery. Do not mix new and old batteries.
- 3.When the infrared thermometer is not used for a long time, please remove the battery.

When the screen backlight is dim, the battery is exhausted. Please replace the battery.

## Chapter 4 Calibration

The infrared thermometer has been calibrated at the factory. If you have doubts about the accuracy of the reading, please contact the after-sales service hotline.

We recommend that you carry out a technical inspection of the measurement every two years, in addition to complying with applicable national regulations. Measurement technical inspections can be performed by the responsible government agency or by an authorized fee-based maintenance service unit.

## Chapter 5 Troubleshooting

During the use of this product, you may encounter the following problems. Please follow the maintenance suggestions to find a solution. If the problem persists, please contact our customer service.

See the following table for common problems and solutions:

Common problems and causes	Maintenance suggestions
Body surface temperature is too low: the temperature value is affected by hair and sweat	Ensure no obstructions during temperature measurement
Body surface temperature is too high	Ensure that the device is used within a measurable temperature range
Body surface temperature is too low: the measurement distance is too far	Please make sure to follow the instructions and re-measure
Enter indoors from low or high temperature outdoors.	Please wait for 30 minutes and wait for the subject's temperature to adapt to the temperature measurement environment before measuring
Low battery/no power on	Check battery installation acutely, install it correctly Battery voltage is too low, replace two new AAA batteries

## Chapter 6 Cleaning and Maintenance

Clean with a dry soft cloth. If the main unit is dirty, wipe it off with a cloth moistened with water and then wipe it with a dry cloth. If necessary, wipe the surface of the product twice with disinfectant to disinfect. It is forbidden to soak or use gas disinfection. Medical alcohol is recommended.

If you need to measure body temperature repeatedly, first clean the infrared forehead thermometer, and clean the infrared forehead thermometer casing and temperature measuring head with an alcohol cotton swab or cotton ball dipped in alcohol (70% alcohol), while avoiding liquid from entering the infrared forehead thermometer. Never use abrasive cleaners, thinners or benzene solvents, and never immerse the infrared thermometer in water or other cleaning solutions.

Do not expose the machine to high temperature, high humidity, dust or direct sunlight.

If the infrared thermometer is not used for a long time, remove the battery.

## Chapter 7 Warranty Services

- This product has a 2-year free warranty with the purchase invoice from the day of purchase.
- We do not provide free warranty service for failures caused by the following personal reasons.
  - Failure caused by unauthorized disassembly and modification;
  - Failure caused by accidental drop during use and handling;
  - Failure caused by lack of reasonable maintenance;
  - Failure caused by not following the correct instructions in the instruction manual;
  - Malfunction caused by improper repairs in repair shops not authorized by our company.
- Repair services outside the warranty will be charged in accordance with regulations.
- When requesting for guarantee services, please consult the after-sales service department.
- Ensure that repair parts will be provided within five years after the product is discontinued.

## Chapter 8 Specifications

**Product Name:** Infrared thermometer

**Security type:** Internal power supply B type application part

**The degree of ingress protection:** Ordinary equipment (closed equipment that does not prevent liquid ingress)

**Safety classification:** The device cannot be used in the case of flammable anesthetic gas mixed with air and the mixture of oxygen or nitrous oxide.

**Operation Mode:** Run the device continuously

**Temperature unit:** °C

**Resolution:** 0.1°C

**Temperature display range:** 32°C-42.9°C

**Maximum allowable error:**

35.0°C-42.0°C, the maximum allowable error is  $\pm 0.2^{\circ}\text{C}$

Other range, the maximum allowable error is  $\pm 0.3^{\circ}\text{C}$

**Measurement time:** less than 1 second

**Display mode:** LCD display

**Power management:** Automatic shutdown without operation

**Power:** DC 3V (2 AAA batteries)

**Production date:** see label

**Body weight:** about 130g

**Normal working and storage conditions:**

1) Temperature range:

Normal work: 16°C-35°C;

Transportation and storage: -20°C-+55°C;

2) Humidity range:

Normal operation:  $\leq 85\%$  (non-condensing);

Transportation and storage:  $\leq 95\%$  (non-condensing);

3) Atmospheric pressure:

Normal work: 700hPa-1060hPa;

Transportation and storage: 500hPa-1060hPa;

## Chapter 9 EMC

**Table 1: electromagnetic emissions**

Guidance and declaration—electromagnetic emissions		
The product is suitable for use in the electromagnetic environment specified below. The customer or the user should assure it to be used in such an environment.		
Emission tests	Compliance	Electromagnetic environment—guidance
Radio frequency(RF) emissions CISPR 11	Croup 1	The device 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.
Radio frequency(RF) emissions CISPR 11	Class B	This product is intended for use in all facilities, including domestic facilities.

**Table 2: electromagnetic immunity 1**

Guidance and declaration—electromagnetic immunity			
The product is suitable for use in the electromagnetic environment specified below. The customer or the user should assure the model to be used in such an environment.			
Emission tests	IEC 60601 test level	Compliance level	Electromagnetic environment—guidance
Electrostatic discharge (ESD) IEC 61000-4-2	$\pm 6$ kV contact $\pm 8$ kV air	$\pm 6$ kV Contact $\pm 8$ 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 %.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	3A/m/50 Hz/60Hz	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.

**Table 3: electromagnetic immunity 2**

Guidance and declaration—electromagnetic immunity			
The product is suitable for use in the electromagnetic environment specified below. The customer or the user should assure the model to be used in such an environment.			
Emission tests	IEC 60601 test level	Compliance level	Electromagnetic environment—guidance
Radiate d RF IEC 61000-4-3	3V/m 80MHz-2.5GHz	3V/m	Portable and mobile RF communications equipment should be used no closer to any part of the model, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance $d = 1.2\sqrt{P}$ $d = 1.2\sqrt{P}$ 80 MHz to 800 MHz $d = 2.3\sqrt{P}$ 800 MHz to 2,5 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). The field strength of the fixed RF transmitter is determined by surveying the electromagnetic field a. In each frequency range b should be lower than the composite level.
<b>Note 1:</b> the higher frequency range applies from 80MHz to 800MHz			
<b>Note 2:</b> These guidance may not be suitable to all situations as 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 model is used exceeds the applicable RF compliance level observed, additional measured may be necessary, such as reorienting or relocation the model.
b. Over the frequency ranges 150KHz to 80 MHz, field strengths should be less than 3V/m

**Table 4: Recommended safety distances**

Recommended separation distances between Portable and mobile RF communications equipment and the monitor			
The product is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the monitor as recommended below, according to the maximum output power of the communications equipment.			
Rated maximum output power of transmitter W	150 kHz ~ 80 MHz $d = 1.2\sqrt{P}$	80 MHz ~ 800 MHz $d = 1.2\sqrt{P}$	800 MHz ~ 2,5 GHz $d = 2.3\sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23
For transmitters rated at a maximum output power not listed above, the recommended separation distance d 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.			
<b>Note 1:</b> At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.			
<b>Note 2:</b> These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.			

### Warning:

- Active medical devices are subject to special EMC precautions and must therefore be installed and used in accordance with these guidelines.
- Electromagnetic fields will affect the performance of the equipment, so other equipment used in the equipment accessories must meet the corresponding EMC requirements.

Mobile phones, X-rays, or MRI equipment are all possible sources of interference because they all emit high-intensity electromagnetic radiation.

●Except for the transducers and cables sold by the manufacturer of the device as spare parts for internal components, the use of accessories, transducers, and cables that are not specified may increase the emissions of the equipment or system or reduce the immunity.

●This device should not be used close to or stacked with other devices. If it must be used close to or stacked, it should be observed to verify that it can operate normally in its used configuration.

●Even if other equipment meets the emission requirements of corresponding national standards, the equipment or system may still be interfered by other equipment.

●This equipment requires special precautions regarding electromagnetic compatibility (EMC), and requires qualified personnel to install and use it in an environment based on the EMC information provided below.

●Do not touch the pins of the machine marked with the electrostatic discharge warning symbol, and unless using electrostatic discharge precautions, make no connection with these connectors.

●To avoid the accumulation of electrostatic charges, it is recommended to store, maintain, and use the device at a relative humidity of 30% or more. The floor should be covered with ESD dissipative rugs or similar items. Wear non-synthetic clothing when using this component.

●To prevent the discharge of static electricity on ESD-sensitive parts of the device, personnel should touch the metal frame of the component or large metal objects attached to the device. When using the device, especially when it may come into contact with the ESD-sensitive parts of the device, wear a grounded wristband designed for use with ESD-sensitive devices. For details on proper use, please refer to the instructions provided with the bracelet.

●All potential users are advised to understand the interpretation of ESD warning symbols and receive training in ESD prevention procedures.

●The most basic content of ESD prevention program training should include: an introduction to the physics of electrostatic charge, the voltage level under normal circumstances, and the damage caused by electrostatically charged operators when they touch electronic components. In addition, methods for preventing static buildup and how and why they are on the ground or equipment before establishing a connection should be explained.

●In addition to transducers and cables sold by equipment or system manufacturers as spare parts for internal components, the use of unspecified accessories, transducers, and cables can result in increased emissions of the equipment or system or reduced immunity.