

# SantaMedical



**Non-contact Infrared Thermometer**

**Model:RY210**

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## **I.SAFETY PRECAUTIONS**

- Follow the maintenance advice stipulated in this instruction manual.
- This device may be used for professional purposes or for personal home use.
- This device must only be used for the purposes described in this instruction manual.
- This device must only be used at the ambient temperature range of between 10 and 40 °C.
- This device must always be kept in a clean, dry area.
- Do not expose this thermometer to electric shocks.
- Do not expose this thermometer to extreme temperature conditions of  $>50^{\circ}\text{C}$  or  $<-20^{\circ}\text{C}$ .
- Do not use this device in relative humidity higher than 85%.
- The protective glass over the lens is the most fragile part of the thermometer.
- Do not touch the glass of the infrared lens with your fingers.
- Clean the glass with a cotton bud lightly moistened with 95° alcohol.
- Do not expose the thermometer to sunlight or to water.
- Do not use this device outside.
- Never drop the device.
- Should a problem occur with your device, please contact your retailer. Do not attempt to repair this device yourself.

THE MANUFACTURER RESERVES THE RIGHT TO ALTER  
THE SPECIFICATIONS OF THE PRODUCT WITHOUT PRIOR NOTIFICATION

## **II.INTRODUCTION**

The SantaMedical RY210 Non-contact Infrared thermometer has been developed using latest infrared technology. This technology allows temporal artery (TA) temperature to be taken at a distance of about 3~5cm away from the forehead. Precise, Instantaneous and without Contact, the RY210 is , to date, the most suitable thermometer for no risk temperature measurement. It has been demonstrated that this method of TA temperature measurement is more precise than tympanic thermometry and better tolerated than rectal thermometry (1).

However, as with other types of thermometer, it is essential to use the SantaMedical RY210 properly in order to obtain reliable and stable results. You are therefore advised to read this instruction manual and the safety precautions carefully before use.

(1)Greenes D, Fleisher G. Accuracy of a Noninvasive Temporal Artery Thermometer for Use in Infants. Arch Pediatr Adolesc Med 2001;155:376.

## **III.PRECAUTIONS BEFORE USE**

<p>The SantaMedical RY210 is pre-set at the factory. It is not necessary to calibrate the device when starting it up.</p>
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In order to obtain reliable and stable results, you are advised each time there is a significant change in the ambient temperature due to a change in environment, to allow the SantaMedical RY210 to acclimatize to this ambient temperature for 15 to 20 minutes before using it.

It is important to allow 3-5 seconds interval between two measurements.

#### **IV. OPERATING PRINCIPLE**

All objects, solid, liquid or gas, emit energy by radiation. The intensity of this energy depends on the temperature of the object. The SantaMedical RY210 Non-contact infrared thermometer is therefore able to measure the temperature of a person by the energy the person emits. This measurement can be taken thanks to an external temperature probe on the device which permanently analyses and registers the ambient temperature. Therefore, as soon as the operator holds the thermometer near the body and activates the radiation sensor, the measurement is taken instantly by detection of the infrared heat generated by the arterial blood flow. Body heat can therefore be measured without any interference from the heat of the surrounding environment.

#### **THE DIFFERENT METHODS OF TEMPERATURE MEASUREMENT**

##### **Core temperature**

Core temperature is the most precise measurement and involves measuring the temperature in the pulmonary artery by means of a catheter equipped with a thermal probe which can read the temperature in situ. The same method is employed for probes measuring the oesophageal temperature. However, such invasive temperature measurement methods require specific equipment and expertise.

##### **Rectal thermometry**

Rectal temperature adjusts slowly in comparison to the evolution of the body's internal temperature. It has been demonstrated that rectal temperature remains raised long after the internal temperature of the patient has started to drop and vice versa. Furthermore, rectal perforations have been known to occur as a result of this method and without appropriate sterilization techniques, rectal thermometry can spread germs often found in Faeces.

##### **Oral thermometry**

Oral temperature is easily influenced by recent ingestion of food or drinks and by breathing through the mouth. To measure oral temperature, the mouth must remain closed and the tongue lowered for three to four minutes which is a difficult task for young children to accomplish.

### Axillary (armpit) temperature

Although it may be easy to measure axillary temperature, it has been proven that it does not provide an accurate measurement of the child's internal temperature. To take this type of temperature, the thermometer must be wedged tightly over the axillary artery. Despite the low sensitivity and relative inaccuracy of axillary temperature in detecting fever, this method is recommended by The American Academy of Pediatrics as a screening test for fever in Newborns.

### Tympanic thermometry

In order to obtain a precise temperature reading, good command of the measurement technique is required. The thermometer probe must be placed as close as possible to the warmest part of the external ear canal. An incorrectly placed probe could lead to a false temperature reading.

### NORMAL TEMPERATURES ACCORDING TO MEASUREMENT METHOD

Measurement Method	Normal temp°
Rectal	36.6°C-38°C
Oral	35.5°C-37.5°C
Axillary	34.7°C-37.3°C
Auricular	35.8°C-38°C
Temporal	35.8°C-37.8°C

The temperature of the human body varies throughout the day. It can also be influenced by numerous external factors: age, sex, type and thickness of skin...

## ADVANTAGES OF TEMPORAL ARTERY (TA) TEMPERATURE

Infrared arterial temperature can be measured using a device placed on the forehead, in the Temporal artery region. It has been demonstrated that this relatively new method of measuring temperature is more precise than tympanic thermometry and better tolerated than rectal thermometry.

The SantaMedical RY210 thermometer has been designed to produce an instant forehead temperature reading without any contact with the temporal artery. As artery is quite close to the surface of this skin and therefore accessible and given the blood flow is permanent and regular, it allows precise measurement of the temperature. This artery is linked to the heart by the carotid artery which is directly linked to the aorta. It forms part of the main trunk of the arterial system. The efficiency, speed and comfort of taking a temperature from this area make it ideal compared with other temperature measurements methods.

## NORMAL TEMPERATURES ACCORDING TO AGE

Age	°C	°F
0-2 years	36.4-38.0	97.5-100.4
3-10 years	36.1-7.8	97.0-100.0
11-65 years	35.9-37.6	96.6-99.7
>65 years	35.8-37.5	96.4-99.5

## PRACTICAL CONSIDERATIONS WHEN TAKING A TEMPERATURE

-In order to ensure that precise and accurate temperature measurements are obtained, it is essential that each user has received adequate information on and training in the temperature measurement technique when using such a device.

-It is essential to remember that although procedures such as taking a temperature may be simple they must not be trivialised.

-Temperature should be taken in a neutral context. The patient must not have undertaken vigorous physical activity prior to taking his/her temperature and the room temperature must be moderate.

-Be aware of physiological variations in temperature which must be taken into consideration when evaluating the results: temperature increased by  $0.5^{\circ}\text{C}$  between 6am and 3pm. Women have a temperature that is higher, on average, by around  $0.2^{\circ}\text{C}$ . Their temperature also varies in accordance with their ovarian cycle. It rises by  $0.5^{\circ}\text{C}$  in the second half of the cycle and at the early stages of pregnancy.

-When sitting, temperature is lower by about  $0.3$  to  $0.4^{\circ}\text{C}$  than when standing.

## HOW TO TAKE A TEMPERATURE

**Aim at the FOREHEAD, over the right temporal region, from a distance of about 3~5cm (1.2in~2in),** press the thermometer's measurement button and the temperature is instantly Displayed.

The reliability of the measurement cannot be guaranteed if the temperature is measured over another part of the body (e.g. arm, torso...)



## CONSTRAINTS

Please observe the following before any temperature measurement to ensure a stable and reliable result:

-Push back hair from the forehead

-Wipe away any perspiration from the forehead

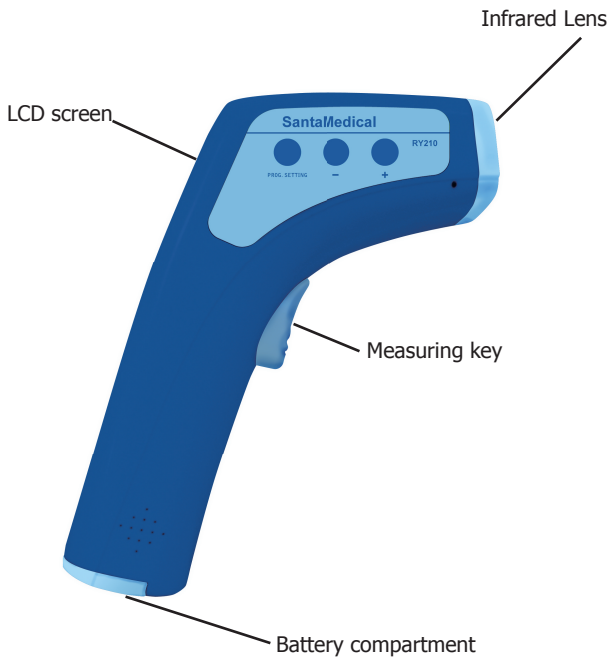
-Avoid any drafts (e.g. from nasal specs, air conditioning...)

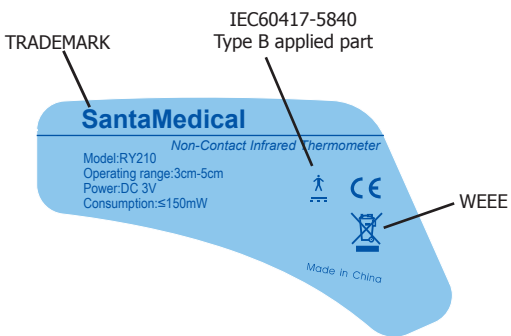
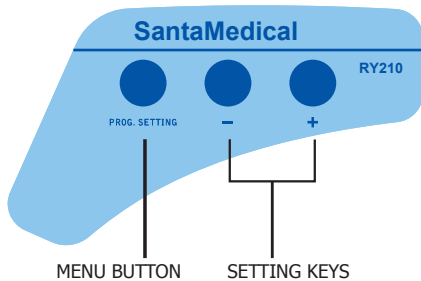
-Allow 3-5 seconds interval between two measurements.

-Each time there is a significant change in the ambient temperature due to a change in environment, to allow the to acclimatize to this ambient temperature for at least 15 minutes before using it.



## V. DESCRIPTION OF THE SantaMedical RY210





## VI. FUNCTIONS

1. Specially designed to take the body temperature of a person regardless of the room temperature.
2. Quick and reliable results as it uses the advantage infrared detection system.
3. Sound alarm if temperature is exceeded.
4. Memorize 32 measures.
5. LCD backlit digital screen.
6. Data displayed in Celsius or Fahrenheit.
7. Automatic stop 30 seconds (energy saver).
8. Small, convenient, easy to use.

### ADDITIONAL USAGE:

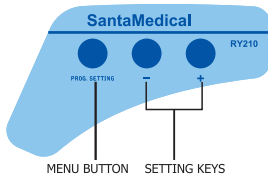
SantaMedical RY210 can also be used to measure the temperature of a baby-bottle or bath, or room temperature (by using the Surface Temp function). This function is in accordance with the Directive 89/336/EEC Electromagnetic Compatibility.

## VII. USAGE

1. Install battery
2. For the first usage or when inserting new batteries wait between 10 minutes for the warm-up of the apparatus and when inserting the new batteries.
3. Aim towards the forehead (see the diagram below for the RY210 positioning), from a distance of 3cm~5cm(1.2in~2in) press the measuring key, the temperature is displayed in 1 second. The temperature can also be taken behind the ear lobe.
4. Before taking the temperature, make sure to remove hair and perspiration from the forehead. You can also take the temperature behind the ear lobe.



## VIII. SETTING & FUNCTION OF MENU



### 1. SWITCH ON THE DEVICE

Press the "Measuring key", one second after the screen panel in full display, it will enter the standby model with the sign "----°C" or "----°F". When then press the "Measuring key" again and get the measuring result in 2 seconds. But if there is no key to press, it will turn off in 30 seconds automatically.

### 2. CHOOSING THE TEMPERATURE UNIT—F1 FUNCTION

Press PROG SETTING button for 3 seconds, the screen displays: F1, Select "-" for degrees Celsius, "+" for degrees Fahrenheit. Confirm by pressing PROG SETTING button.

### 3. ALARM SETUP – F2 MENU

Press PROG SETTING button for 3 seconds, the screen displays: F1. Press PROG SETTING button to get F2. Select "+" to increase the threshold by 0.1°C (0.1°F), "-" to reduce it by 0.1°C (0.1°F). Confirm by pressing PROG SETTING button.

**Note: The alarm threshold default value is 38°C (100.4°F)**

### 4. CHOICE OF DISPLAY MODE: BODY OR SURFACE TEMP – F3 MANU

The SantaMedical RY210 is specially designed to take the body temperature of a human being.

FOR this, use the BODY mode.

Measurement range for Body mode: 32°C-42.9°C (89.6°F-109.2°F)

You can also use the SantaMedical RY210 to measure the temperature of an area or an object, a food, a liquid or a room temperature. For this, use the SURFACE TEMP mode.  
Measurement range for Surface TEMP mode: 0°C-60°C (32°F-140°F)

Press PROG SETTING button for 3 seconds, the screen displays: F1.  
Press PROG SETTING button twice to get F3.  
Select 0 by pressing "-" button to get the BODY mode.  
Select 1 by pressing "+" button to get the SURFACE TEMP mode  
Confirm by pressing PROG SETTING button.

**Note: The SantaMedical RY210 is automatically set to BODY**

Important: The area temperature differs from the internal body temperature. To obtain the internal temperature always use the BODY mode.

Please make sure to select the BODY mode for an internal temperature reading and the SURFACE TEMP mode for an external area reading (bottle, bath, Room...).

#### 5. TOTAL DIFFERENCE – F4 MANU

**To adjust total variation of your SantaMedical RY210**

Press PROG SETTING button for 3 seconds, the screen displays: F1.  
Press PROG SETTING button three times to get F4.  
Select "+" to increase the difference by 0.1°C (0.1°F), "-" to reduce it by 0.1°C (0.1°F).  
Confirm by pressing PROG SETTING button.  
If in doubt, you are advised to leave the total variance at + 0.0°C (original setting).

Each time there is a significant change in the ambient temperature due to a change in environment, to allow the RY210 to acclimatize to this ambient temperature for at least 15 minutes before using it.

## 6. BUZZER ON/OFF – F5 MENU

Press PROG SETTING button for 3 seconds, the screen displays: F1.

Press four times PROG SETTING button to get F5.

Select "+" to open the buzzer ( a sound icon is displayed on the LCD screen), press "-" to stop it (the icon disappear).

Confirm by pressing PROG SETTING button.

## 7. EXITING THE SETTING MODE

Press PROG SETTING button until the screen turns off.

## 8. DATA MEMORY

To display the last temperature measurement, press simultaneously the "-" and "+" button.

You will obtain the last temperature measurement. To switch on the last measurement, press the "+" button.

The number indicated in interval of two measures corresponds to the number of measurements.

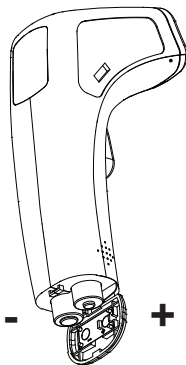
To exit data memory, press the measure key. The SantaMedical RY210 switches off in 30 seconds.

## 9. CHANGING THE BATTERIES

Display: when the LCD screen displays "Battery", the battery is used.

Operation: Open the lid and change the batteries, taking great care with the correct positioning. A mistake with could cause damage to the apparatus and compromise the guarantee of your SantaMedical RY210 .

Never use rechargeable batteries. Use only batteries for single usage.



## **IX. TECHNICAL CHARACTERISTICS**

1.Normal conditions of use

Operating temperature: 10 °C ~40 °C (50 °F ~104 °F)

Humidity rate: ≤ 85%

2.Power: DC 3V (2 batteries AA)

3.Package Size: 200×145×50mm (L×W×H)

4.Unit Weight: 136g (without batteries)

5.Display Resolution: 0.1 °C (0.1 °F)

6.Measuring range:

In Body mode: 32 °C ~42.9 °C (89.6 °F ~109.2 °F)

In Surface Temp mode: 0 °C ~60 °C (32 °F ~104 °F)

7.Precision: 32 °C ~36 °C (89.6 °F ~96.8 °F)=±0.3 °C (±0.6 °F)

36 °C ~39 °C (96.8 °F ~102.2 °F)=±0.2 °C (±0.4 °F)

39 °C ~42.9 °C (102.2 °F ~109.2 °F)=±0.3 °C (±0.6 °F)

8.Consumption: ≤ 150mW

9.Measuring distance: 3cm-5cm(1.2in-2in)

10.Automatic stop: 30 sec

## **LONGEVITY USE**

The SantaMedical RY210 is guaranteed for 40,000 takings.

## **X. ADVICE**

-The protective glass over the lens is the most important and fragile part of the thermometer, please take great care of it.

-Clean the glass with cotton fabric, wet with 95° alcohol

-Do not use other batteries than mentioned batteries, do not recharge non rechargeable batteries, do not throw in fire.

-Remove the batteries when thermometer is not used for an extended period of time.

-An impact will damage the product.

## **XI. ACCESSORIES SUPPLIED**

User manual in English 1 pc

AA alkaline battery 2 pcs

pouch 1 pc

## **XII.TROUBLESHOOTING**

If you have one of the following problems while using your SantaMedical RY210, please refer to this breakdown service guide to help resolve the problem. If the problem persists please contact our customer service.

The screen displays temperature superior to 95°

The temperature is in Fahrenheit change the measurement to Celsius (by pressing the Program Setting button to get the F1 function key)

The screen displays the body temperature inferior to 32°C (89.6°F)

To take a body temperature the function key F3 must be on Body mode. If you're on Surface Temp mode the 32°C (89.6°F) temperature displayed is showing the external temperature that your body releases.

The screen displays the message HI



When using the SantaMedical RY210 the message HI can show on the screen.

The analysis is above the measurement range selected, either superior to 42.9°C (109.2°F) in Body Mode or superior to 60°C (140°F) in Surface Temp Mode.



## THE SCREEN DISPLAYS THE MESSAGE LO



When using the SantaMedical RY210 the message Lo can show on the screen.

The temperature analyzed is under the measuring range selected, either less than 32 °C (89.6 °F) in Body Mode or less than 0 °C (32 °F) in Surface Temp Mode.

This message displays in various cases – please find below a list of the main cases:

<b>Reasons for LO message display</b>	<b>Advice</b>
Temperature reading hampered by hair, perspiration...	Make sure that there is no obstruction prior to taking a temperature.
Temperature hampered by an air flux.	Make sure there is no air flux as this could interfere with the infrared system.
Temperature readings too close together, the RY210 did not have the chance to boot itself.	Respect the pause of 15 seconds minimum between two readings 3~5 seconds pause is advised.
The measuring distance is too far.	Please respect the measuring distance (between 3 and 5 cm-1.2in and 2in)