

# AccuMed

Non-Contact Infrared Thermometer



Model: AT2103

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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 in an ambient temperature range of between 50°F (10°C) and 104°F (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  $>131^{\circ}\text{F}$  (55°C) or  $<-4^{\circ}\text{F}$  (-20°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 ball, lightly moistened with 95% alcohol.
- Do not expose the thermometer to sunlight or to water.
- 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 AT2103 Non-contact Infrared thermometer has been developed by using the latest infrared technology. This technology allows Temporal Artery (TA) temperature to be taken at a distance of about 3cm~5cm away from the forehead. Precise, Instantaneous and without Contact, the AT2103 is, up to now, the most suitable thermometer for no risk on temperature measurement. It has been demonstrated that this method of TA temperature measurement is more precise than the Tympanic Thermometry and better tolerated than Rectal Thermometry (1).

However, as with other types of thermometers, it is essential to use the AT2103 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 AT2103 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 AT2103 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 AT2103 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 place. The same method is employed for probes measuring the esophageal 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 feces.

### **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	97.8° F ~ 100.4° F
ORAL	95.9° F ~ 99.5° F
AXILLARY	94.5° F ~ 99.1° F
AURICULAR	96.4° F ~ 100.4° F
TEMPORAL	96.4° F ~ 100.4° F

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 AT2103 thermometer has been designed to produce an instant forehead temperature reading without any contact with the temporal artery. As this artery is quite close to the surface of the skin and therefore accessible and the blood flow is permanent and regular, this allows for 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 makes it ideal compared with other temperature measurement methods.

### NORMAL TEMPERATURES ACCORDING TO AGE

Age	° C	° F
0-2 years	36.4-38.0	97.5-100.4
3-10 years	36.1-37.8	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 trivialized.

- 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 increases by 0.9°F between 6 am and 3 pm. Women have a temperature that is higher, on average, by around 0.3°F. Their temperature also varies in accordance with their ovarian cycle. It rises by 0.9°F in the second half of the cycle and at the early stages of pregnancy.
- When sitting, temperature is lower by about 0.5°F to 0.7°F than when standing.

### HOW TO TAKE A TEMPERATURE

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



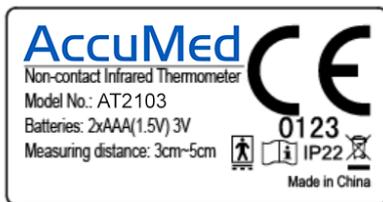
The reliability of the measurement cannot be guaranteed if the temperature is measured over another part of the body (e.g. arm, torso...)

### 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 a 1 minute interval between two measurements.
- Each time there is a significant change in the ambient temperature due to a change in environment, to allow the AT2103 to acclimatize to this ambient temperature for at least 15 minutes before using it.

## V. BASIC INSTRUMENT



Symbol	Reference
<b>AccuMed</b>	Trade mark
	IEC 60417-5333, Type BF applied part
	IEC 60417-5031 Direct current
<b>IP22</b>	IEC 60529 Ingress protection
	WEEE Directive (2002/96/EC)
	Consult operating instructions

## **VI. FEATURES**

- 1.Special design to take the Human Body Temperature with a 1.2in~2in (3cm~5cm) distance from forehead.
- 2.Reliable and stable measurement, thanks to the advantage of the Infrared Detection System.
- 3.Audible alarm if temperature is more than 100.4°F (38°C).
- 4.Stores the last 32 temperature measurements taken.
- 5.Tri-color backlit LCD digital display screen.
- 6.Temperature unit can be displayed in either Celsius or Fahrenheit.
- 7.Automatic power-off (30 secs) to conserve energy.
- 8.Longevity use (40,000 readings).
- 9.Practical, easy to use.

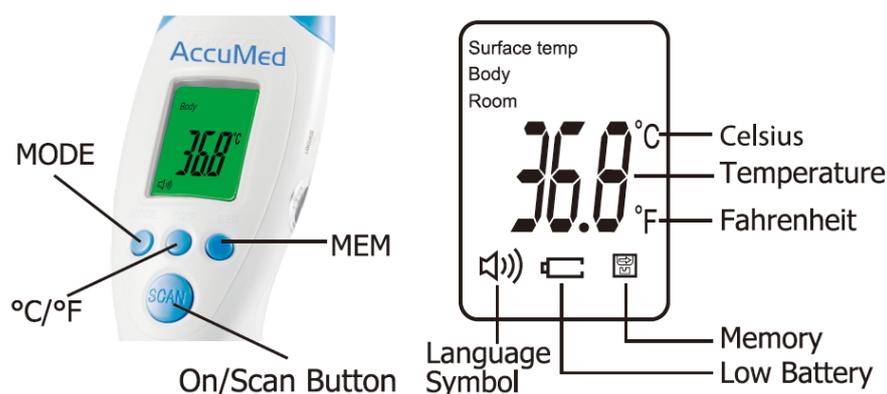
### **ADDITIONAL USAGE:**

AT2103 can also be used to measure the temperature of a baby-bottle or bath (by using the Surface Temp Mode), or room temperature (by using the Room Mode).

## **VII. INSTRUCTIONS**

- 1.Install battery.
- 2.For the first use or when inserting new batteries, please wait from 10~15 minutes for the warm-up of the unit. This will allow the unit to become acclimated to the temperature of the room.
- 3.Press the "On/Scan" button to turn the device on, aim towards the forehead (see the diagram below for the AT2103 positioning), from a distance of 3cm~5cm, press the "On/Scan" button again to take a reading, the temperature is displayed in 1 second.
- 4.Before taking the temperature, make sure to move aside any hair and perspiration from the forehead.

## VIII. SETTING AND FUNCTION OF MENU



### 1. Switch on the device:

Press the “On/Scan” button for one second, after the screen panel is in full display, it will enter the standby mode with the sign “---°C” or “----°F”.

Then press the “On/Scan” button again, you will get the measuring result in 1 second. But if there is no more operation, it will turn off in 30 seconds automatically.

### 2. Setting the mode when the device is On:

- Press “MODE” button, and the screen will display: Body...°C
- Press again “MODE” button and the screen will display: Room...°C
- Press again “MODE” button and the screen will display: Surface Temp...°C

**Note: The thermometer default is set to BODY mode.**

### 3. Switching between Celsius and Fahrenheit:

Press the “°C/°F” button to transfer between Celsius and Fahrenheit.

### 4. Reviewing Stored Memory:

Press the “MEM”(Memory) button, which will then display the last temperature, and allows for a view of the last 32 measurements.

#### Important!

The surface temperature differs from the internal body temperature. To obtain the internal temperature, always use the “BODY” mode. Please make sure to select “SURFACE TEMP” mode for an external area reading.

### 5. When the device is on, press “LANGUAGE” button to enable/disable the voice.

When the screen shows “ON”, the voice enabled.

When the screen shows “OFF”, the voice disabled.

### 6. Recalibration of device via the “F-4” MENU

When there is the difference between AT2103 and a mercury thermometer, and you believe the mercury thermometer is more accurate, you can use the recalibration function to adjust the AT2103 to make it the same as a mercury thermometer.

-Instructions for recalibration:

While the device is On, Press the "MODE" and "°C/ °F" buttons simultaneously for 3 seconds.

The screen will then display : "F-4"

Press "MODE" to increase by 0.1°F,

Press "°C/ °F" to reduce 0.1°F.

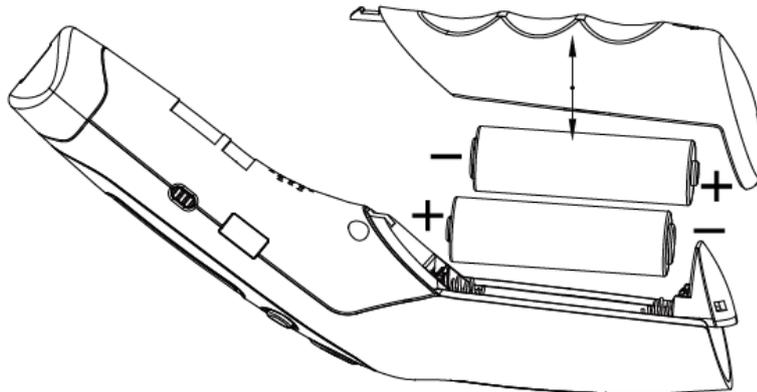
Press "MEM" button to save the setting.

\*In the cases of seasonal or environmental changes, a verification and adjustment should be carried out.

## 7. CHANGING THE BATTERIES

Display: when the LCD screen displays the flashing symbol "  ", the battery is low and needs to be replaced soon

Operation: Open the lid and change the batteries, taking great care with the correct positioning. A mistake with this could cause damage to the apparatus and compromise the guarantee of your AT2103. Never use rechargeable batteries. Use only batteries for single usage.



## IX. TECHNICAL SPECIFICATIONS

1.Normal using condition

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

Relative humidity: ≤85%

2.Batteries: 2 x AA batteries (Included)

3.Unit size: 6.9 x 1.9 x 2 in (L x W x H)

4.Unit weight (including batteries): 0.32lbs (148g)

5.Temperature display resolution: 0.1°F (0.1°C)

6.Measuring range:

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

In "Body" mode, there are three color-identifiers for temperatures:

Green color backlit: ≤99.1°F (37.3°C), means normal temperature.

Orange color backlit: 99.3°F~100.2°F (37.4°C~37.9°C), means low fever.

Red color backlit: ≥100.4°F (38°C), means high fever.

In surface temp mode: 32°F ~ 140°F (0°C ~ 60°C)

In room mode: 32°F ~ 104°F (0°C ~ 40°C)

7.Precision:

89.6°F ~ 96.6°F (32.0°C ~ 35.9°C)      ±0.3°C(±0.6°F)

96.8°F ~ 102.2°F (36.0°C ~ 39.0°C)      ±0.2°C(±0.4°F)

102.4°F ~ 109.2°F (39.1°C ~ 42.9°C)      ±0.3°C(±0.6°F)

8.Consumption: ≤300mW

9.Accuracy: ± 0.6°F (0.3°C)

10.Measuring distance: 1.2in ~ 2in (3cm ~ 5cm)

11.Automatic power-off: 30 secs

12.Memory: 32 sets

※ Note: The Non-contact Infrared Thermometer Model AT2103 can take temperature readings below 89.6°F to 109.2°F (32°C or above 42.9°C) but precision is not guaranteed outside of this range.

### **LONGEVITY OF THE PRODUCT**

The AT2103 was built for an intense and professional use, its longevity is guaranteed for 40,000 readings.

## **X. MAINTENANCE OF THE PRODUCT**

- 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 a cotton ball, 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.
- Do not expose the thermometer to sunlight or water.
- An impact will damage the product.

## **XI. ACCESSORIES**

User Manual	1 pc
AA Alkaline Batteries	2 pcs
Carrying Bag	1 pc

## **XII. GUIDELINES**

This device complies with the EU Directive 93/42/EEC concerning medical products, the ASTM E

1965-98 and the European Standard EN60601-1-2 and is subject to particular precautions with regard to electromagnetic compatibility.

### XIII. TROUBLESHOOTING

If you have problems while using your thermometer, please refer to this guide to help resolve the problem. If the problem persists, please contact our customer service.

#### THE SCREEN DISPLAYS TEMPERATURE HIGHER THAN 42.9°C (109.2°F):

The temperature is in Fahrenheit. Change the measurement to Celsius by pressing the “°C/ °F” button.

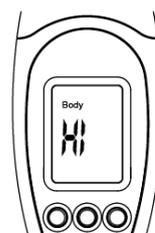
#### THE SCREEN DISPLAYS TEMPERATURE LOWER THAN 32°C (89.6°F):

To take the surface temperature, press the “Mode” button and set to the reading called “Body” , If the device is in Surface Temp Mode, the 32°C (89.6°F) temperature displayed is showing the external temperature of your body, rather than the internal.

#### THE SCREEN DISPLAYS THE MESSAGE HI

When using the AT2103 Thermometer, the message “HI” can show on the screen.

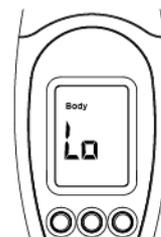
In this case, the temperature is above the measurement range selected, above 42.9 °C (109.2°F) in Body Mode.



#### THE SCREEN DISPLAYS THE MESSAGE LO

When using the AT2103 Thermometer, the message “LO” can show on the screen.

In this case, the temperature analyzed is under the measuring range selected, less than 32°C (89.6°F) in Body Mode.



**This message displays for various reasons. Please find below a list of the main issues:**

Reasons for LO message display	Advice
Temperature reading hampered by hair or perspiration.	Make sure there is no obstruction or dampness prior to taking temperature.
Temperature hampered by an air draft or dramatic change in ambient temperature.	Make sure there is no air blowing in the area of use; this could affect the infrared reading.
Temperature readings are too close together, and the thermometer did not have time to reboot.	Pause for 3~5 seconds minimum between readings; a 15 second pause is recommended.
The measuring distance is too far.	Take measurements at the recommended distance (approx. 3~5 cm; 1.2in~2.0in).

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