

# ANKOVO

## User Manual

Non Contact Infrared Body Thermometer

Model:HTD8813C



Please read this manual before operating this device, important safety information inside.

## Catalogue

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## Foreword

The Non Contact Infrared Body Thermometer Operating Instructions intend to provide the necessary information for proper operation of HTD8813C Thermometer model.

General knowledge of Infrared Thermometer and an understanding of the features and functions of the HTD8813C Thermometer model are prerequisites for proper use.

The Non Contact Infrared Body Thermometer can be used repeatedly, which using life is 3 years.

Please read the manual first before using it, if not fully understand the usages, please stop using the thermometer.



Do not operate any of the model HTD8813C Thermometer without completely reading and understanding these instructions.

## Notice

Purchase or possession of this device does not carry any express or implied license to use with replacement parts which would, alone or in combination with this device, fall within the scope of one of the relating patents.

## Safety Information

This device may only be used for the purposes described in these instructions. The manufacturer cannot be held liable for damage caused by incorrect application.

The Non Contact Infrared Body Thermometer is designed to minimize the possibility of hazards from errors in the software program by following Sound and light Engineering Design Processes, Risk Analysis and Software Validation.

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## Warning

Warnings are identified by the WARNING symbol shown above.

- The Non Contact Infrared Body Thermometer is to be operated by consumers in the home setting and primary care setting as screening tool. This manual, accessories, direction for Use, all precautionary information, and specifications should be read before use.
- This product is designed to measure human body temperature on the forehead. Do not use it for any other purpose.
- This product is intended in the home setting and primary care setting as screening tool.
- Do not use the thermometer if it malfunctions or has been damaged in any matter.
- When the ambient temperature of the thermometer changes too much, such as moving the Thermometer from one place of lower temperature to another place of higher temperature, allow the thermometer to remain in a room for 30 minutes where the temperature is between 15 °C to 35 °C (59 °F - 95 °F).
- Remove primary batteries if equipment is not likely to be used for long time.
- This product is not waterproof, do not be immersed in water or other liquid; If cleaning and disinfection, please follow the "Care and Storage" section requirements.
- Do not touch the sensor of infrared detection with your fingers.
- If a cold compress on the forehead fever patients, or take other measures to cool down, the temperature data will be low, should be avoided in this case to measure body temperature.
- If measure human forehead temperature, please select "body" mode; for measure other objects, liquids, food and other temperature please select "surface" mode.
- This product must be operated in a stable environment, if the ambient environment was mutations, please should be note whether there is fog on the sensor, if any, before using accordance with the "Care and Storage" section to removing the fog.

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- Do not near strong electrostatic field or strong magnetic fields, thus avoiding the impact on the accuracy of the measurement data.
- Do not mix the old and new batteries to avoid damage to the product.
- It may affect the accuracy of measurements when the forehead is covered by hair, perspiration, cap or scarf.
- The measuring result of this product is only for your reference. If you have any doubt, please measure the temperature in other methods.

⚠ The device should be kept out of the reach of children/pets. When not in use, store the device in a dry room and protect it against extreme moisture, heat, lint, dust and direct sunlight. Never place any heavy objects on the storage case.

⚠ Do not throw batteries into fire.

⚠ Only use recommended batteries. Do not use rechargeable batteries.

⚠ This thermometer irreplaceable the diagnostic in hospitals.

⚠ Do not fall, disassemble or modify the device.

⚠ Do not use this device if you think it is damaged or notice anything unusual.

⚠ This device comprises sensitive components and must be treated with caution. Observe the storage and operating conditions described in the 'Technical Specifications' section.

⚠ Not servicing/maintenance while the Thermometer is in use.

⚠ When using, shall not touch battery and the patient simultaneously.

⚠ Do not use the device if it is damaged /degraded /loosened in any way. The continuous use of a damaged unit may cause injury, improper results, or serious danger.

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⚠ Based on the current science and technology, other potential allergic reactions are unknown.

⚠ This equipment needs to be installed and put into service in accordance with the information provided in the ACCOMPANYING DOCUMENTS.

## 1- OVERVIEW

### Intended Use

The Non Contact Infrared Body Thermometer are designed to be used for intermittent measurement and monitoring of human body temperature by consumers in the home setting and primary care setting as screening tool.

### Description of Non Contact Infrared Body Thermometer

#### ▪ Device principle and introduction

The Non contact Thermometer are hand-held, reusable, battery operated devices, which can measure human body temperature on forehead, the skin temperature on one's forehead.

The operation principle is based on Infrared Sensor technology. The IR sensor can output different signal when measuring different object temperature or in different ambient temperature, and the ASIC can turn the signal from IR Sensor to a digital value and display it on the LCD.

#### ▪ Description on Controls, Indicators, and Symbols

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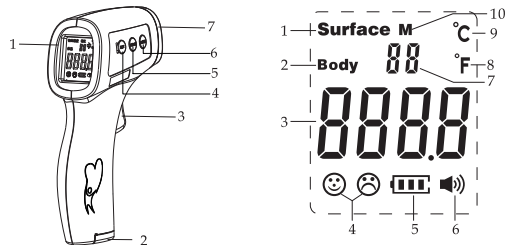


Figure 1: HTD8813C Infrared body thermometer

1. LCD Display
2. Battery Cover
3. ON/Scan Button
4. Set Button
5. MEMO Button
6. MODE Button
7. IR Sensor

- 1.Surface Mode
- 2.Body Mode
- 3.Digital Display
- 4.Smiley or Cry Indicator
- 5.Battery Indicator
- 6.Buzzer on/off Indicator
- 7.Memory number
- 8.°F
- 9.°C
- 10.Memory

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### Thermometer Applications

| Thermometer Model Number | Thermometer Style                      | Adult |          | Pediatric |          |
|--------------------------|----------------------------------------|-------|----------|-----------|----------|
|                          |                                        | Ear   | Forehead | Ear       | Forehead |
| HTD8813C                 | Non Contact Infrared Body Thermometers |       | ✓        |           | ✓        |

### Equipment Symbols

|             |                                                                                                                                                                                                  |  |                                                                                     |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------------------------------------------------------------------------------------|
|             | Warning                                                                                                                                                                                          |  | Compliance with WEEE Standard                                                       |
|             | Non sterile Packaging                                                                                                                                                                            |  | DO NOT THROW AWAY Intended for multiple use                                         |
|             | Refer to Operating instructions                                                                                                                                                                  |  | Operating atmospheric pressure                                                      |
|             | Operating Temperature                                                                                                                                                                            |  | serial number                                                                       |
|             | Operating Humidity                                                                                                                                                                               |  | recyclable                                                                          |
|             | manufacturer                                                                                                                                                                                     |  | This device complies with Part 15 of FCC (Federal Communications Commission) Rules. |
| <b>IP22</b> | IP22: The first number 2: Protected against solid foreign objects of 12.5 mm Φ and greater. The second number: Protected against vertically falling water drops when enclosure tilted up to 15°. |  |                                                                                     |

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## Technical Specifications

|                                     |                                                                                                                                                                                                                                                                                                      |
|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Measurement Unit                    | °C/°F                                                                                                                                                                                                                                                                                                |
| Operating mode                      | Adjusted mode(Body mode)<br>Direct mode(surface mode)                                                                                                                                                                                                                                                |
| Measuring site                      | Forehead                                                                                                                                                                                                                                                                                             |
| Reference Body Site                 | Axillary                                                                                                                                                                                                                                                                                             |
| Rated output range                  | Body mode: 35.0°C-42.0°C/95.0°F-107.6°F<br>Surface mode: 0.0°C-100.0°C/ 32.0°F-212.0°F                                                                                                                                                                                                               |
| Extended output range               | Body mode: 34.0°C-34.9°C/ 93.2°F-94.8°F; 42.1°C-42.9°C/107.8-109.2°F                                                                                                                                                                                                                                 |
| Range                               | Body mode: 34.0°C-42.9°C/ 93.2°F-109.2°F<br>Surface mode: 0.0°C-100.0°C/ 32-212°F                                                                                                                                                                                                                    |
| Accuracy                            | Body mode:<br>34.0°C-34.9°C:±0.3°C/ 93.2°F-94.8°F:±0.5°F;<br>35.0°C-42.0°C:±0.2°C/95.0°F-107.6°F:±0.4°F;<br>42.1°C-42.9°C:±0.3°C/107.8°F-109.2°F: ±0.5°F;<br>Surface mode:±2.0°C/±3.6°F                                                                                                              |
| Display Resolution                  | 0.1°C/0.1°F                                                                                                                                                                                                                                                                                          |
| Three-color Backlight (Color Alarm) | 35.5°C-37.3°C/ 95.9°F-99.1°F: Green (Normal Temperature);<br>37.4°C-38.0°C(Alarm point) / 99.3°F-100.4°F: Yellow (Slight Fever)<br>38.1°C-42.9°C/ 100.6°F-109.2°F: Red(High Fever)<br>Note: 1.Surface mode is always with Green backlight.<br>2. In body mode 34.0°C-35.4°C is with green backlight. |
| Auto Power Off Time                 | ≤18s                                                                                                                                                                                                                                                                                                 |
| Measuring Time                      | ≤2S                                                                                                                                                                                                                                                                                                  |
| Measuring Distance                  | 1CM-5CM(0.4-2in)                                                                                                                                                                                                                                                                                     |
| Memories                            | 50                                                                                                                                                                                                                                                                                                   |

|                                 |                                                                                                                |
|---------------------------------|----------------------------------------------------------------------------------------------------------------|
| Power Supply Requirements       |                                                                                                                |
| Batteries                       | 1.5V (AAA) alkaline batteryX2 (IEC Type LR03)                                                                  |
| Adaptable Range                 | 2.6V~3.6V                                                                                                      |
| Environmental                   |                                                                                                                |
| Operating Condition             | Operating Temperature:15.0°C-35.0°C(59.0°F~95.0°F), Relative Humidity≤85%<br>atmospheric pressure:70Kpa-106Kpa |
| Transport and Storage Condition | Storage Temperature:-20°C~+55°C / -4~131°F, Relative Humidity≤93%<br>atmospheric pressure:70-106Kpa            |

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|                               |                                                                |
|-------------------------------|----------------------------------------------------------------|
| Dimension and Weighting       |                                                                |
| Weight (without batteries)    | 90g                                                            |
| Size                          | L:138mm X W:95mm X H:40mm                                      |
| Compliance                    |                                                                |
| Item                          | Compliant with                                                 |
| Equipment classification      | Safety Standards: EN 60601-1: 2006+A1:2013, EN 60601-1-2: 2007 |
| Type of protection            | Internally powered equipment (on battery power)                |
| Degree of protection          | Non Applied part                                               |
| Front panel and case labeling | EN ISO15223-1:2012                                             |
| Temperature                   | EN ISO80601-2-56:2012                                          |
| Home healthcare environment   | EN 60601-1-11:2010                                             |

## Calculated values of the indicators according to ISO 80601-2-56

|                                    |                  |
|------------------------------------|------------------|
| Indicators                         | Calculated value |
| Clinical bias, $\Delta_{bias}$     | -0.027           |
| Standard deviation, $\sigma_1$     | 0.14             |
| Limits of agreement, $L_A$         | 0.26             |
| Clinical repeatability, $\sigma_r$ | 0.07             |

Note: the above value is calculated from clinical data of HTD8818A

## Safety classification of ME EQUIPMENT

|                                                                   |                                 |
|-------------------------------------------------------------------|---------------------------------|
| Protection against electric shock                                 | Internally powered ME equipment |
| Applied part                                                      | Non Applied part                |
| Protection against harmful ingress of water or particulate matter | IP22                            |
| Mode of operation                                                 | Continuous operation            |

Note: Not intended to be sterilized. Not for use in an OXYGEN RICH ENVIRONMENT

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## 2- OPERATION

### 2.1 Battery installation

Caution: The Non Contact Infrared Body Thermometer does not operate with dead batteries and does not input outer power. Install new batteries.

- 1) Pull the battery downward, toward the bottom of the Non Contact Infrared Body Thermometer, and remove the battery access door;
- 2) Insert two pieces AAA size batteries according to the "+" and "-";
- 3) Close the battery cover:

### 2.2 How to Operate

#### Before Applying the Thermometer

Be sure to read and understand all Warnings listed of the instructions before use.

- The thermometer is aligned with the middle of the forehead to measure body temperature (between the eyebrows above) and keep the vertical distance, press the On/Scan button, temperature display immediately, see figure 2.

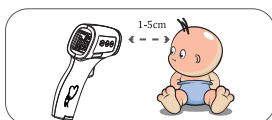


Figure 2-Measuring position and distance

- When the ambient temperature of the thermometer changes too much, such as moving the Thermometer from one place of lower temperature to another place of higher temperature, Allow the thermometer to remain in a room for 30 minutes where the temperature is between 15°C to 35°C.

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- The ambient temperature around the test person should be stable, should keep away from the larger flow fan, air-conditioning vents and so on.
- When people moving from one place of lower temperature to another place of higher temperature, should at least remain in the test environment more than 5 minutes, to be consistent with the ambient temperature after the re-measurement.
- Wait at least 1 second for the next measurement. If the continuous measurement of five times, it is recommended to wait at least 30 seconds and then continue measurement.
- You cannot use the thermometer in place where the sun is strong.
- If for some reason the low forehead temperature measurement can try to align behind the ears. See figure 3.

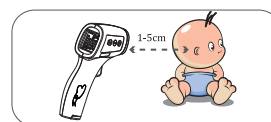


Figure 3- Align behind the ears to measurement

### General Setup and Use

- Start measuring
  1. Turn on the thermometer by pressing the On/Scan button. The thermometer will perform self-test with all segments displayed for 2 seconds.
  2. Align staff forehead to keep the distance, and then press the On/Scan button to start the measurement, read the data.

Note: 1) After full display over, you will hear a rattle or "beep beep beep" three times, which means that the measurements have been completed, while the target value of the measured temperature is displayed on the LCD, while backlit display according to

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the appropriate setting among the three colors red, green, yellow one of. And the Green means ready for next measurement. When 37.4°C-38.0°C, it's yellow ,means slight fever warning. Please pay attention to body temperature. When the body temperature is above 38.1°C, it's red , means high fever. Please take action to cool down or go for a doctor.

2) To ensure the accuracy of the measurement, wait at least 30 seconds after 5 consecutive measurements.

#### ■ Mode conversion

When the device is running, press the MODE button to cycle conversion between "body" mode and "surface" mode.

"body" mode is used for measuring human body temperature, the "surface " mode is used to measure the surface temperature. (The factory default is "body" mode).

#### ■ Recalling and Erasing Memory Data

The last temperature taken before the thermometer powers off is stored in memory, up to 50.

HTD8813C as below step:

- 1) In the boot or shutdown state, short press the MEMO button to view the history of measured values.
- 2) An empty memory cell shows "---°C " or "---°F".
- 3) Temperature readings can be stored in memory. Up to 50 temperature readings can be stored into the memory cells and automatically overwrite historical data.
- 4) In boot mode, press the MEMO button until the LCD display "CLr", which means that all stored data is cleared completely.

#### ■ Parameter settings

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This product can be set according to the subjects of different colors and different environments data to meet the different characteristics of populations or individuals. Long press the MODE button to modify the measurement parameters.

#### 1) Unit Set-F1

Under the boot mode .Long press SET button to enter F1, press the "MODE" or "MEMO" button to switch Celsius and Fahrenheit temperature units, press the SET button to confirm the unit settings (factory default is Fahrenheit ).

#### 2) Fever alert set-F2

Under F1 state, press SET button to enter the F2, press the "MODE" button to decrease 0.1 °C, press the "MEMO" button plus 0.1 °C, long press to accelerate the speed of temperature regulation, and finally press the SET button to save. (The factory default is 38.1 °C)

#### 3) Prompt sound settings-F3

Under F2 state , short press SET button to enter F3, press MODE button or MEMO button to set voice switch, and press the SET button to confirm the settings. (The factory default is the voice Prompt to open).

#### 4) Overall temperature offset value-F4

To meet the different colors, different characteristics of the population, or the environment caused by seasonal temperature change is large that need for temperature detection and debugging.

Under F3 state , short press the SET button to enter F4, press the MEMO button to plus 0.1 °C, press the MODE button decrease 0.1 °C, long press fast subtraction temperature, and then SET button to confirm the parameter setting.

Parameter adjustment range: -5°C and +5°C (factory default is 0).

#### 5) Exit setting mode

In the F4 mode, press the SET button will automatically turn off the screen, exit setting.

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### 3- TROUBLESHOOTING

| MESSAGE                                                                             | SITUATION                                                                                                            | SOLUTION                                                                                                                                         |
|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
|  | Temperature taken in not within Typical human temperature range. (34.0°C- 42.9 °C or 93.2°F- 109.2°F).               | Make sure the forehead thermometer is for forehead measurement, not other human body site.                                                       |
|  | Measured over the distance 1-5 cm(0.4-2 in).                                                                         | Optimum measurement distance is 1cm.                                                                                                             |
|  | Incorrect test position.                                                                                             | See figure 2 Measuring position and distance.                                                                                                    |
|  | Subjects forehead hair, Antipyretic stickers, head with sweat, etc.                                                  | Subjects sit quietly 5-10 minutes before the test.                                                                                               |
|  | Some people's body temperature is lower than the general population.                                                 | The main concern fever temperature                                                                                                               |
|  | F4 overall temperature offset is set incorrectly                                                                     | Adjust the temperature offset value                                                                                                              |
|  | Operating temperature exceeds the range of specified temperature.                                                    | Move to a room within the operating range wait 30 minutes before taking temperature.                                                             |
|  | The screen flicker, automatic turn off.                                                                              | Replace battery or the product has been damaged, needs repairs.                                                                                  |
|  | Battery capacity is too low. Taking Temperature is not allowed.                                                      | Install a new battery                                                                                                                            |
|  | Ambient temperature changes too fast                                                                                 | Wait until the ambient temperature is stable.                                                                                                    |
|  | (1) Power is off.<br>(2) Improper battery installation.<br>(3)The battery is exhausted.<br>(4)Display remains blank. | (1)Press On/Scam button again.<br>(2)Check the battery polarity.<br>(3)Replace with a new battery.<br>(4)Contact the retailer or service center. |

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### 4-REPLACING THE BATTERY

- Open and release battery cover following indicator on the surface of battery cover. Before changing the battery be sure the system is already power off.
- Remove the battery and replace with 2 new one, type AAA, Make sure align properly as indicated inside the battery cover .
- Slide the battery cover back in until it snaps in place.
- Do not dispose of used batteries in household waste. Take them to special local collection sites.
- In case, if system is latched up after changing battery. You may not follow up the process of rule one. Just take off battery, waiting 30 sec, then load battery again.

#### ⚠ Warning

Do not recharge, disassemble or dispose of in fire.

- The typical service life of the new and unused batteries is 2000 measurements for the operation time is 18s.
- Only use the recommended batteries, do not recharge non-rechargeable batteries, and do not burn them.
- Remove the batteries if the thermometer is not to be used for a long period.

### 5-CLEANING, CARE AND STORAGE

The lens is very delicate.

It is very important to protect the lens from dirt and damage.

Use a clean, soft cloth to clean the surface of the device and LCD. Do not use solvents or immerse the device into water or other liquids.

Always keep the thermometer a within the storage temperature and humidity range as specified.

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It is recommended to store the thermometer in a dry location free from dust.

Always keep the thermometer within the storage temperature range (- 20°C to 55°C or - 4°F to 131°F) and humidity range (≤93% non-condensing).

It is recommended to store the thermometer in a dry location free from dust. Do not expose the thermometer to direct sunlight, high temperature/ humidity or any extreme environment, otherwise the function will be reduced.

When the ambient temperature of the thermometer changes too much, such as moving the thermometer from one place of lower temperature to another place of higher temperature, allow the thermometer to remain in a room for 30 minutes where the temperature is between 15°C to 35°C.

## 6-DISPOSAL

- Used batteries should not be disposed of in the household rubbish. Used Batteries should be deposited at a collection point.
- At the end of its life, the appliance should not be disposed of in household rubbish. Enquire about the options for environment-friendly and appropriate disposal. Take local regulations into account.

## 7-WARRANTY

Our company warrants Non Contact Infrared Body Thermometer at the time of its original purchase and for the subsequent time period of one year.

The warranty does not cover the followings:

- The device series number label is torn off or cannot be recognized.
- Damage to the device resulting from misconnection with other devices.
- Damage to the device resulting from accidents.
- Changes performed by users without the prior written authorization of the company.
- Batteries and packaging are not covered under warranty

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When asked to provide warranty service, you must have a purchase date and purchase stamp dealers (including dealers name and address) of the warranty card. Be sure to ask the dealer to purchase this product signature on the warranty card. When asked to provide warranty service, please put the product to get our distribution points for repair. Products outside the warranty expires, will be charged accordingly.

Note:

- If you have any problems with this device, such as setting up, maintaining or using, please contact with SERVICE PERSONNEL of us. Don't open or repair the device by yourself.
- Please report to us if any unexpected operation or events occur.
- The patient is an intended operator. The patient can measure and change battery. Under normal circumstances and maintain the device and its accessories according to the user manual.

## 8-Calibration

The thermometer is initially calibrated at the time of manufacture. If this thermometer is used according to the use instructions, periodic re-adjustment is not required. If at any time you question the accuracy of temperature measurements, please contact us timely.

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## 9-EMC Declaration

- This equipment needs to be installed and put into service in accordance with the information provided in the ACCOMPANYING DOCUMENTS;

This product needs special precautions regarding EMC and needs to be installed and put into service according to the EMC information provided, and this unit can be affected by portable and mobile RF communications equipment.

- Do not use a mobile phone or other devices that emit electromagnetic fields, near the unit. This may result in incorrect operation of the unit.
- Caution: this unit has been thoroughly tested and inspected to assure proper performance and operation!
- Caution: this machine should not be used adjacent to or stacked with other equipment and that if adjacent or stacked use is necessary, this machine should be observed to verify normal operation in the configuration in which it will be used.

| Guidance and manufacture's declaration – electromagnetic emission                                                                                                                                                                             |                |                                                                                                                                                                                                                                          |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The Non Contact Infrared Body Thermometer is intended for use in the electromagnetic environment specified below. The customer of the user of the Non Contact Infrared Body Thermometer should assure that it is used in such an environment. |                |                                                                                                                                                                                                                                          |
| Emission test                                                                                                                                                                                                                                 | Compliance     | Electromagnetic environment – guidance                                                                                                                                                                                                   |
| RF emissions CISPR 11                                                                                                                                                                                                                         | Group 1        | The Non Contact Infrared Body Thermometer use 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.                            |
| RF emission CISPR 11                                                                                                                                                                                                                          | Class B        | The Non Contact Infrared Body Thermometer is suitable for use in all establishments, other than domestic and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes. |
| Harmonic emissions IEC 61000-3-2                                                                                                                                                                                                              | Not applicable |                                                                                                                                                                                                                                          |
| Voltage fluctuations/ flicker emissions IEC 61000-3-3                                                                                                                                                                                         | Not applicable |                                                                                                                                                                                                                                          |

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| Guidance and manufacture's declaration – electromagnetic immunity                                                                                                                                                                          |                                                                                                                                                                                                                                                               |                            |                                                                                                                                                                                                                                                                                                                                            |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The Non Contact Infrared Body Thermometer is intended for use in the electromagnetic environments specified below. The customer or the user of Non Contact Infrared Body Thermometer 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                                                                                                                                                                                                | ±6 kV contact<br>±8 kV air                                                                                                                                                                                                                                    | ±6 kV contact<br>±8 kV air | Floors should be wood, concrete or ceramic tile. If floor are covered with synthetic material, the relative humidity should be at least 30%.                                                                                                                                                                                               |
| Electrical fast transient/burst IEC 61000-4-4                                                                                                                                                                                              | ±2 kV for power supply lines<br>±1 kV for input/output lines                                                                                                                                                                                                  | Not applicable             | Mains power quality should be that of a typical commercial or hospital environment.                                                                                                                                                                                                                                                        |
| Surge IEC 61000-4-5                                                                                                                                                                                                                        | ± 1 kV line(s) to line(s)<br>± 2 kV line(s) to earth                                                                                                                                                                                                          | Not applicable             | Mains power quality should be that of a typical commercial or hospital environment.                                                                                                                                                                                                                                                        |
| Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11                                                                                                                                        | <5% U <sub>n</sub> (>95% dip in U <sub>n</sub> ) for 0.5 cycle<br>40% U <sub>n</sub> (60% dip in U <sub>n</sub> ) for 5 cycles<br>70% U <sub>n</sub> (30% dip in U <sub>n</sub> ) for 25 cycles<br><5% U <sub>n</sub> (>95% dip in U <sub>n</sub> ) for 5 sec | Not applicable             | Mains power quality should be that of a typical commercial or hospital environment. If the user of the Non Contact Infrared Body Thermometer requires continued operation during power mains interruptions, it is recommended that the Non Contact Infrared Body Thermometer be powered from an uninterruptible power supply or a battery. |
| Power frequency (50Hz/60Hz) magnetic field IEC 61000-4-8                                                                                                                                                                                   | 3 A/m                                                                                                                                                                                                                                                         | 3 A/m                      | Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.                                                                                                                                                                                                  |
| NOTE U <sub>n</sub> is the a.c. mains voltage prior to application of the test level.                                                                                                                                                      |                                                                                                                                                                                                                                                               |                            |                                                                                                                                                                                                                                                                                                                                            |

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| Guidance and manufacture's declaration – electromagnetic immunity                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                             |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The Non Contact Infrared Body Thermometer is intended for use in the electromagnetic environment specified below. The customer or the user of the Non Contact Infrared Body Thermometer should assure that it is used in such an environment.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                             |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Immunity test                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | IEC 60601 test level        | Compliance level | Electromagnetic environment - guidance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Conducted RF<br>IEC 61000-4-6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 3 Vrms<br>150 kHz to 80 MHz | Not applicable   | Portable and mobile RF communications equipment should be used no closer to any part of the Non Contact Infrared Body Thermometer, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.<br><br>Recommended separation distance<br>$d = 1,2\sqrt{P}$<br>$d = 1,2\sqrt{P}$ 80 MHz to 800 MHz<br>$d = 2,3\sqrt{P}$ 80 MHz to 2,5 GHz                                                                                                                                              |
| Radiated RF<br>IEC 61000-4-3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 3 V/m<br>80 MHz to 2,5 GHz  | 3 V/m            | 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 metres (m).<br><br>Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey <sup>a</sup> , should be less than the compliance level in each frequency range <sup>b</sup> .<br><br>Interference may occur in the vicinity of equipment marked with the following symbol:  |
| NOTE 1 At 80 MHz and 800 MHz, the higher frequency range applies.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                             |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                             |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <sup>a</sup> 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 Non Contact Infrared Body Thermometer is used exceeds the applicable RF compliance level above, the Non Contact Infrared Body Thermometer should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the Non Contact Infrared Body Thermometer. |                             |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <sup>b</sup> Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                             |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

| Recommended separation distances between portable and mobile RF communications equipment and the Non Contact Infrared Body Thermometer .                                                                                                                                                                                                                                                                                                                                                                                  |                                                               |                                        |                                         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|----------------------------------------|-----------------------------------------|
| The Non Contact Infrared Body Thermometer is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the Non Contact Infrared Body Thermometer can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the Non Contact Infrared Body Thermometer as recommended below, according to the maximum output power of the communications equipment. |                                                               |                                        |                                         |
| Rated maximum output power of transmitter(W)                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Separation distance according to frequency of transmitter (m) |                                        |                                         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 150 KHz to 80 MHz<br>$d = 1,2\sqrt{P}$                        | 80 MHz to 800 MHz<br>$d = 1,2\sqrt{P}$ | 800 MHz to 2,5 GHz<br>$d = 2,3\sqrt{P}$ |
| 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 metres (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.                                                                                                                                                                                          |                                                               |                                        |                                         |
| NOTE 1 At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                               |                                        |                                         |
| NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.                                                                                                                                                                                                                                                                                                                                                        |                                                               |                                        |                                         |

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