Riester

Gebrauchsanweisung
Infrarot-Multifunktions-Thermometer
Instructions
Infrared Multifunction Thermometer
Mode d'emploi
Thermomètre à infrarouge multifonctions
Instrucciones para el uso
Termómetro multifuncional infrarrojo
Инструкця по эксплуатации
Инфракрасный многофункциональный термометр
Istruzioni per l'uso
Termometro multifunzionale a infrarossi

CE 0124

ri-thermo® N

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1. Important information – please read before start-up

You have acquired a high-quality Riester multi-function infrared thermometer manufactured in compliance with Directive 93/42/ EEC for medical products and subject to continuous stringent quality control, ensuring reliable results for years to come.
Clinical thermometers
Part 5: Performance of infra-red ear thermometers (with maximum device)
German version EN 12470-5
Please read these Instructions carefully prior to start-up and keep them in a safe place. Should you have any queries, we will be pleased to assist you at any time. You will find our address on the last page of these Instructions. We will be pleased to supply you with the address of your authorized RIESTER distributor on request.
Please note that correct and safe operation of this thermometer will be guaranteed only when RIESTER accessories are used throughout.

Please note the following prior to using the thermometer:

1. Ensure that the measuring probe (1) is shielded by a disposable probe cover (2) (even when the thermometer is not being used).
2. Keep the multi-function thermometer out of reach of children.
3. Keep the multi-function thermometer away from sources of intense heat, otherwise it could be damaged. (Do not hold the thermometer in a flame).
4. The multi-function thermometer must not be exposed to the sun for any length of time, as this will result in inaccurate temperature readings.

5. Do not make temperature measurements on metallic objects, as this will result in inaccurate (i.e. low) temperature readings.
6. Improper handling or use of the thermometer will damage it.
7. When the batteries become low replace them immediately with new batteries in order to avoid inaccurate readings.
8. The "ri-thermo® N" thermometer is not intended to be used as a substitute for a physician's accurate diagnosis. In case of doubt, please consult your physician.
9. When measuring the temperature of fluids or surfaces, keep the thermometer at least 5 mm away from them.
10. **Never use the thermometer without probe cover, as this can lead to wrong measurements.**

Meaning of the symbol on the bottom label: Please pay attention to the user manual

Meaning of the symbol on the bottom label: Applied Part Type BF

For Canada

1. Infrared thermometers should not be used shortly after exercise, bathing or coming indoors.
2. Infrared thermometers should not be used on children under 2 years of age. For older children, infrared thermometers should not be used to manage important health concerns.
3. Parents should not rely only on temperature readings; if they have concerns, they should seek medical advice.

2. Applications

This Ear Thermometer is intended for the intermittent measurement and monitoring of human body temperature in the home. It is intended for use on people of all ages.

3. The Advantages of this Ear Thermometer

Multiple Use (Wide Range Measurement)
The ri-thermo® N offers a wide range measurement feature ranging from 0- 100.0 °C (32.0 - 212.0 °F); the product can be used as an ear thermometer to measure body temperature, but it also can be used to measure surface temperature of following objects:

- Milk surface temperature in baby's bottle
- Surface temperature of baby's bath
- Ambient temperature

Measurement in 1 second
The innovative infrared technology allows measurement of ear temperature in only 1 second.

Accurate and reliable
Due to the unique probe assembly construction, the advanced infrared sensor, and the complete calibration process this unit can offer a very accurate and reliable ear temperature measurement.

Gentle and Easy to Use

- Special ergonomic design enables simple and easy use of the thermometer.
- The ri-thermo® N can be used without interference to daily lifestyle. A measurement can be taken even while a child is sleeping.
- The ri-thermo® N is pleasant to use for the children.

- The ri-thermo® N is less threatening to a child than a rectal thermometer and more pleasant to use than an oral thermometer.

Auto-Display Memory

The product displays the last reading automatically for 2 seconds when the unit is switched ON.

Multiple Reading Recalls

Users will be able to recall the last 12 readings when entering the recall mode, enabling tracking of temperature variation in a more efficient way.

Safe and Hygienic

- No risk of broken glass or mercury ingestion.
- Completely safe for use on children.
- Disposable probe covers make ri-thermo® N completely hygienic.

Fever Alarm

10 short beeps alert the patient that he/she may have fever.

4. Important Safety Instructions

- Never use the ri-thermo® N for purposes other than those it has been intended for. Please follow the general safety precautions when using on children.
- Always use the ri-thermo® N with a new undamaged Probe Cover for each measurement to prevent infection. Only Riester branded probe covers can ensure that you get an accurate measurement.

- Never immerse the ri-thermo® N into water or other liquids (not waterproof). For cleaning and disinfecting please follow the instructions in the <Cleaning and Storage> section.

- Keep the ri-thermo® N and the probe covers away from direct exposure to the sun and keep it in a dust-free, dry area at the temperature between 5 - 40 °C (41 - 104 °F).

- Do not use the ri-thermo® N if there are signs of damage on the measuring tip or on the instrument itself. If damaged, do not attempt to repair the instrument! Please contact your nearest Riester customer service bureau.

- Earwax in ear canal may cause a lower temperature reading. Make sure subject's ear canal is clean to ensure an accurate reading.

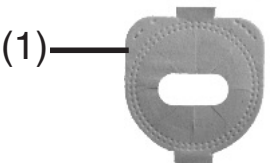
- The ri-thermo® N consists of high-quality precision parts. Do not drop the instrument! Protect it from severe impact and shock. Do not twist the instrument and the measuring probe!

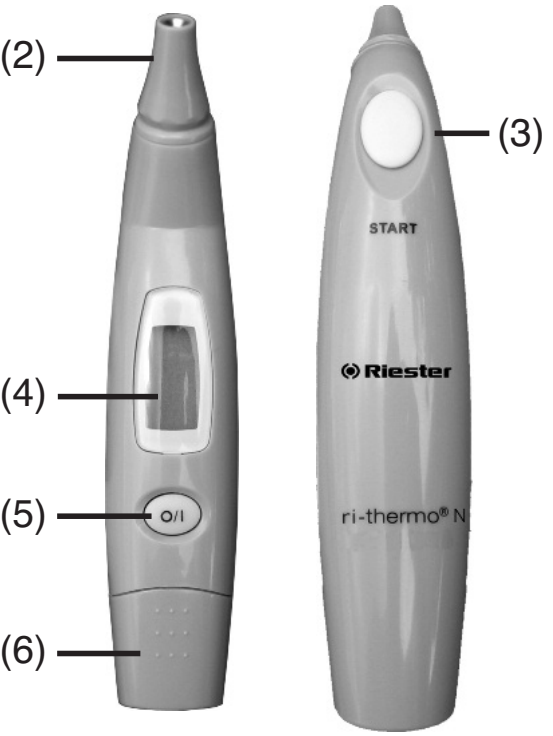
WARNING:

- Please keep the probe covers out of the reach of children.
- Use of this IR thermometer is not intended as a substitute for consultation with your physician.

5. Product Description

(1) Probe Cover
(2) Probe
(3) Start button
(4) LCD Display
(5) O/I button
(6) Battery Cover





6. How this Ear Thermometer Measures Ear Temperature

The ri-thermo® N measures infrared energy radiated from the eardrum and the surrounding tissue. This energy is collected through the lens and converted to a temperature value. The measured reading obtained directly from the eardrum (Tympanic Membrane) can ensure the most accurate ear temperature. Measurements taken from the surrounding tissue of the ear canal generate lower readings and may result in misdiagnosis of a fever.

To avoid an inaccurate measurement:

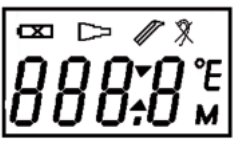
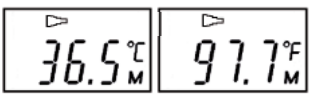
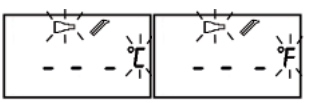
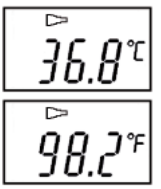
- First slip on a probe cover.
- Switch on the thermometer by pressing the O/I button.
- After one beep is heard (and the temperature

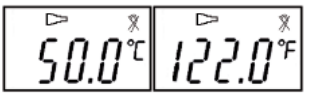
scale icon is flashing), straighten the ear canal by gently pulling the middle of the ear back and up.

- Place the probe firmly into the ear canal, press the Start button and keep the probe in the ear until the thermometer beeps to identify the completion of the measurement.

The ri-thermo® N has been clinically tested and proven to be safe and accurate when used in accordance with its operating instruction manual.

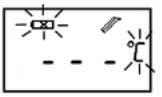
7. Control Displays and Symbols

LCD Display	Display Meaning	Description
	All segments displayed	Press the O/I button to run on the unit, all segments will be shown for 2 seconds.
	Memory	The last reading will be shown on the display automatically for 2 seconds.
	Ready	The unit is ready for the measurement, the °C or °F and the probe cover icon will flashing.
	Measurement complete	The reading will be shown on the LCD display with the °C or °F icon flashing, the unit is ready again for the next measurement.



Crossed-ear icon

The crossed-ear icon shown up when the measurement is outside the normal range 32.0-42.2 °C.

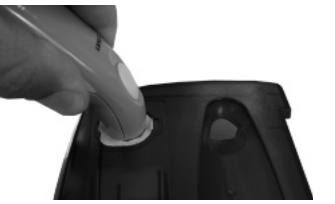


Low battery indication

When the unit is turned on, the battery icon will keep flashing to remind the user to replace the batteries

8. How to Reload a New Probe Cover

Place a probe cover onto the storage case hole with paper side upwards.



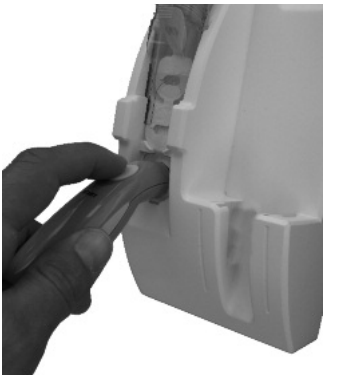
Take the unit, vertically penetrate the probe into the center part of the probe cover.

Completely push the probe into the probe cover holder hole.

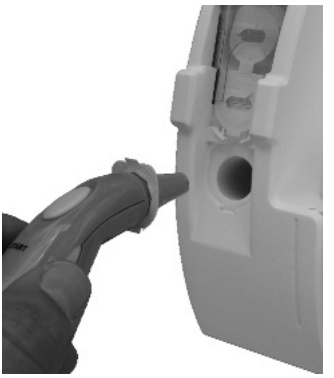
Take out the probe with cover attached tightly.

ri-former® extension module ri-thermo® N

Place a probe cover onto the storage case hole with paper side upwards.



Take the unit, vertically penetrate the probe into the center part of the probe cover.



Completely push the probe into the probe cover holder hole.

Take out the probe with cover attached tightly.

NOTE:

- In order to avoid cross-contamination, please reload a new probe cover for each measurement.
- Please check if the probe cover is fitted on firmly before use (please see the diagrams below); If the probe cover is broken, discard the probe cover and reload a new one immediately.

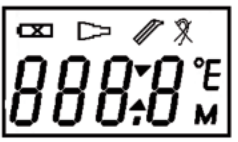
(X) Incorrect

(O) Correct

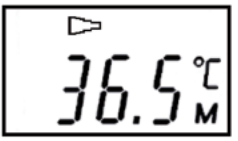
9. Directions for Use

Important: Prior to every measurement, fit a new undamaged Probe Cover on the measuring probe. Failure to do so may result in incorrect temperature measurement.

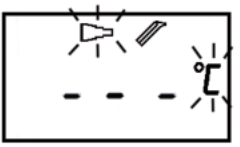
1. Press the O/I button. The LCD is activated to show all segments for 2 seconds.



2. The last measurement reading will be shown on the display automatically for 2 seconds with the <M> icon.



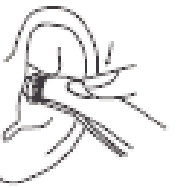
3. When the °C or °F icon is flashing, a beep sound is heard and the thermometer is ready for the measurement.



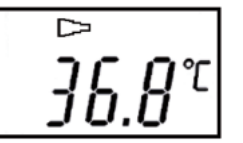
4. Straighten the ear canal by pulling the ear up and back to give a clear view of the eardrum.

- For children under 1 year: Pull the ear straight back
- Children aged 1 year to adult: Pull the ear up and back.

5. While tugging the ear, insert the probe snugly into the ear canal and press the <START> button. Release it, when you hear a beep sound. This is the reminding signal that comfirms the end of measurement.



6. Remove the thermometer from the ear canal. The LCD displays the measured temperature.



NOTE:
10 short beeps will sound when the temperature is higher than 37.5 °C in order to alert the patient that he/she may have fever.

7. Replace the probe cover after each measurement. To do this, please follow the instruction in point 8 <How to Reload a New Probe Cover>.

8. In order to assure the accurate readings, please wait at least 30 seconds after 3-5 continuous measurements.

NOTE:

- For an infant, it is best to have the child laying flat with his head sideways so the ear is facing upwards. For an older child or adult, it is best to stand behind and slightly to the side of the patient.
- Always take the temperature in the same ear, since the temperature readings may be different from the right ear and left ear.
- Please wait for a few minutes to take the ear temperature after sleeping.
- In the following situations it is recommended that three temperatures in the same ear be taken and the highest one taken as the reading:

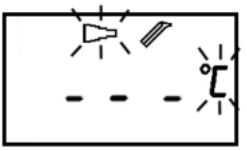
1) New born infants in the first 100 days.
2) Children under three years of age with a com-

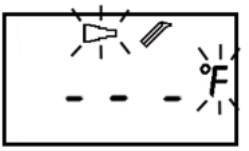
promised immune system and for whom the presence or absence of fever is critical.

3) When the user is learning how to use the ri-thermo® N for the first time until he/she has familiarized himself/herself with the instrument and obtains consistent readings.

10. Changing from Fahrenheit to Celsius and vice-versa

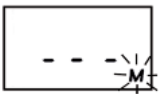
The Riester Digital Infrared Thermometer ri-thermo® N can display temperature measurements in either Fahrenheit or Celsius. To switch the display between °C and °F, simply turn OFF the unit, press and hold the Start button for 5 seconds; When you stop pressing the Start button after 5 seconds, the current measurement scale (°C or °F icon) will be flashed on the display. Toggle the measurement scale between °C and °F by pressing the start button again. When the measurement scale has been chosen, wait for 5 seconds and the unit will enter the ready for measuring mode automatically.

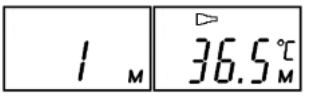
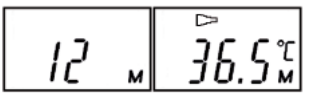




11. How to recall 12 readings in Memory Mode

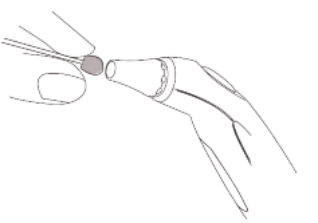
The Riester Digital Infrared Thermometer ri-thermo® N can recall the last 12 readings, to recall please follow sequence.

LCD Display	Display Meaning	Description
	Recall Mode	Press the START button toenter Recall Mode whenpower is off.The memory icon «M» flashes.

	Reading 1 (the last reading)	Press and release the START button to recall the last rea-ding. Display 1 alone with memory icon.
	Reading (the second last reading)	Press and release the START button to recall secondlatest reading
	Reading 12 (the last reading)	Press and release the START button consecutively to recall readings in succession, up to the last 12 readings.

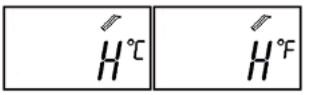
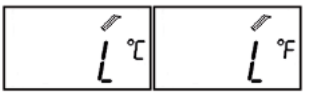
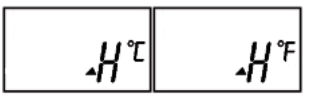
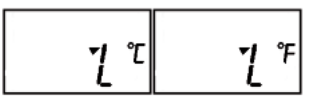
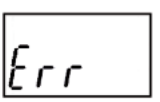
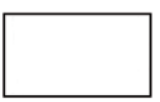
Pressing and releasing the START button after the last 12 readings have been recalled will resume the above sequence from reading 1.

12. Cleaning and Storage



Use an alcohol swab or cotton swab moistened with alcohol (70% Isopropyl) to clean the thermometer casing and the measuring probe. Ensure that no liquid enters the interior of the thermometer. Never use abrasive cleaning agents, thinners or benzene for cleaning and never immerse the instrument in water or other cleaning liquids. Take care not to scratch the surface of the LCD.
Remove the battery from the instrument if it is not required for extended periods of time in order to avoid damage to the thermometer resulting from a leaking battery.

13. Error messages

Display / Problem	Display Meaning	Possible cause and fault remed
	Measured Temperature too high	Displays <H> when measured temperature higher than 100.0 °C or 212.0 °F.
	Measured temperature too low	Displays <L> when measured temperature lower than 0 °C or 32.0 °F.
	Ambient temperature too high	Displays <H> in conjunction with the ▲ when ambient temperature is higher than 40.0 °C or 104.0 °F.
	Ambient temperature too low	Display <L> in conjunction with the ▼ when ambient temperature is lower than 5.0 °C or 41.0 °F.
	Error function display	When system has malfunction.
	Blank display	Please check if the battery has been loaded correctly. Also check polarity (<+> and <->) of batteries.
	Dead battery indication	If the steady battery icon is the only symbol shown on the display, the batteries should be replaced immediately.

14. Replacing the battery

The Riester Digital Infrared Thermometer is supplied with one lithium battery, type CR2032. Replace with a new CR2032 battery when the flashing battery symbol appears on the LCD display. Remove the battery cover by sliding it. Take out the battery and put in a new one.

15. Technical Specifications

Type:	Digital Infrared Thermometer ri-thermo® N
Measuring Range:	0 °C to 100.0 °C (32.0 °F to 212.0 °F)
Accuracy:	Laboratory: ±0.2 °C, 32.0 ~ 42.2 °C (±0.4 °F, 89.6 ~ 108.0 °F) ±1°C, 0 ~ 31.9 °C, 42.3 ~ 100.0 °C (±2 °F, 32.0 ~ 89.5 °F, 108.1~ 212.0°F)
Display:	Liquid Cristal Display with indicating unit 0.1 °C (0.1 °F)
Acoustic:	a. The unit is turned ON and ready for the measurement:1 short <bi> sound. b. Complete the measurement: 1 long beep sound. c. System error or malfunction: 3 short <bi> sounds.
Memory:	a. Auto-Display the last measured temperature when switched on. b. 12 readings recall in the Memory mode
Operating temperature:	5 °C to 40 °C (41.0 °F to 104 °F)
Storage/ transport temperature:	-25 °C to +55 °C (-13 °F to 131 °F)

Automatic Switch-off:	Approx. 1 minute after last measuremen has been taken.
Battery:	CR2032 BATTERY (X1) - at least 1000 measurements
Dimensions:	153 mm (L) x 31 mm (W) x 40 mm (H)
Weight:	53g (w/ battery), 50g (w/o battery)
Standards:	Complies with EN12470-5 and ASTM E-1965 requirements

According to the Medical Product User Act a biennial technical inspection is recommenden for professional users. Please observe the applicable disposal regulations.

16. Symbol

Used electrical and electronic products are not to be disposed as unsorted municipal waste and are to be collected separately accordingly to national/EU regulations.

17. Calibration

Germany:
As stipulated in the Medical Processes Regulations (MPBetreibV), an annual calibration must be carried out. Inspections may only be carried out by the manufacturer, by authorized weights and measures officials or by persons who meet the requirements according to § 6 of the German Medical Processes Regulations (MPBetreibV).

European Union (not including Germany)
In all European Union states except Germany, the respective applicable national statutes apply.

Countries outside of the European Union

For countries which have no legal regulations governing measurement calibration inspections, we recommend that thermometers be calibrated annually.

18. EMC requirements

- The thermometer complies with the EMC requirements according IEC 60601-1-2. Radio transmitting equipment, cellular phones etc. must not be used in close proximity to the thermometer, since this could influence the performance of the thermometer. Particular care must be taken when using strong emission sources such as radio-frequency surgical equipment and similar equipment, such as ensuring, for example, that RF cables are not installed on or near the thermometer. If in doubt, contact a qualified technician or your local distributor.

  You may find a detailed description of the manufacturers EMC declaration at the end of this user manual.

Warranty

This product has been manufactured under the strictest quality standards and has undergone a thorough final quality check before leaving our factory.

We are therefore pleased to be able to provide a warranty of

2 years from the date of purchase

on all defects, which can verifiably be shown to be due to material or manufacturing faults. A warranty claim does not apply in the case of improper handling.

All defective parts of the product will be replaced or repaired free of charge within the warranty period. This does not apply to wearing parts.

A warranty claim can only be granted if this Warranty Card has been completed and stamped by the dealer and is enclosed with the product.

Please remember that all warranty claims have to be made during the warranty period.

We will, of course, be pleased to carry out checks or repairs after expiry of the warranty period at a charge. You are also welcome to request a provisional cost estimate from us free of charge.

In case of a warranty claim or repair, please return the RIESTER product with the completed Warranty Card to the following address:

Rudolf Riester GmbH

Dept. Repairs RR

Bruckstr. 31

72417 Jungingen

Germany

Serial number or batch number

Date

Stamp and signature of the specialist dealer

Guidance and manufacturer's declaration – electromagnetic emission –
for all EQUIPMENT AND SYSTEMS

1	Guidance and manufacturer's declaration – electromagnetic emission		
2	The IR1DE1 Infrared Ear Thermometer is intended for use in the electromagnetic environment specified below. The customer or the user of IR1DE1 Infrared Ear Thermometer should assure that it is used in such an environment.		
3	Emissions test	Compliance	Electromagnetic environment - guidance
4	RF emissions CISPR 11	Group 1	The IR1DE1 Infrared Ear Thermometer uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
5	RF emissions CISPR 11	Class B	
6	Harmonic emissions IEC 61000-3-2	N/A	
7	Voltage fluctuations / flicker emissions IEC 61000-3-3	N/A	

**Guidance and manufacturer's declaration – electromagnetic immunity –
for all EQUIPMENT and SYSTEMS**

Guidance and manufacturer's declaration – electromagnetic immunity			
The IR1DE1 Infrared Ear Thermometer is intended for use in the electromagnetic environment specified below. The customer or the user of the IR1DE1 Infrared Ear 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 ± 8 kV air	± 6 kV contact ± 8 kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30 %.
Electrostatic transient / burst IEC 61000-4-4	± 2 kV for power supply lines ± 1 kV for input/output lines	N/A	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	± 1 kV differential mode ± 2 kV common mode	N/A	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_T (>95 % dip in U_T) for 0.5 cycle 40 % U_T (60 % dip in U_T) for 5 cycles 70 % U_T (30 % dip in U_T) for 25 cycles < 5 % U_T (>95 % dip in U_T) for 5 sec	N/A	Mains power quality should be that of a typical commercial or hospital environment. If the user of the IR1DE1 Infrared Ear Thermometer requires continued operation during power mains interruptions, it is recommended that the IR1DE1 Infrared Ear Thermometer be powered from an uninterruptible power supply or a battery.
Power frequency (50/60 Hz) 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_T is the a. c. mains voltage prior to application of the test level.			

Guidance and manufacturer's declaration – electromagnetic immunity – for EQUIPMENT and SYSTEM that are not LIFE-SUPPORTING

Guidance and manufacturer's declaration – electromagnetic immunity

The IR1DE1 Infrared Ear Thermometer is intended for use in the electromagnetic environment specified below. The customer or the user of the IR1DE1 Infrared Ear Thermometer should assure that it is used in such an environment.

Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment - guidance
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz	N/A	Portable and mobile RF communications equipment should be used no closer to any part of the IR1DE1 Infrared Ear Thermometer, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. **Recommended separation distance** $d = [\frac{3.5}{V_1}]\sqrt{P}$
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2.5 GHz	3 V/m	$d = [\frac{3.5}{E_1}]\sqrt{P}$ 80 MHz to 800 MHz $d = [\frac{7}{E_1}]\sqrt{P}$ 800 MHz to 2.5 GHz where p is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in metres (m).[b] Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey,[a] should be less than the compliance level in each frequency range.[b] 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 is affected by absorption and reflection from structures, objects and people.

[a] Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the IR1DE1 Infrared Ear Thermometer is used exceeds the applicable RF compliance level above, the IR1DE1 Infrared Ear Thermometer should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the IR1DE1 Infrared Ear Thermometer .

[b] Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3V/m.

Recommended separation distances between portable and mobile RF communications equipment and the EQUIPMENT or SYSTEM - for EQUIPMENT and SYSTEMS that are not LIFE-SUPPORTING

Recommended separation distances between portable and mobile RF communications equipment and the IR1DE1 Infrared Ear Thermometer

The IR1DE1 Infrared Ear Thermometer is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the IR1DE1 Infrared Ear Thermometer can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the IR1DE1 Infrared Ear Thermometer as recommended below, according to the maximum output power of the communications equipment

Rated maximum output of transmitter W	Separation distance according to frequency of transmitter m 150 kHz to 80 MHz $d = [\frac{3.5}{V_1}]\sqrt{P}$	80 MHz to 800 MHz $d = [\frac{3.5}{E_1}]\sqrt{P}$	800 MHz to 2.5 GHz $d = [\frac{7}{E_1}]\sqrt{P}$
0.01	/	0.12	0.23
0.1	/	0.38	0.73
1	/	1.2	2.3
10	/	3.8	7.3
100	/	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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