SATA®

工业级红外测温仪 800
Industry Infrared Thermometer 800

03032

使用说明书 \ User's Manual

中文 EN

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简介

本产品是一款专业的手持式非接触红外线测温仪，通过测量物体表面辐射的红外能量来确定物体的表面温度。具有使用简单、结构结实耐用、测量精度高、测温范围大等特点。具有 8 点圆激光定位、数据保持、屏幕背光、发射率可调和自动关机功能。

工作原理

本红外测温仪由光学系统、光电探测器、信号放大器和信号处理与显示输出系统等部分组成。光学系统汇聚其视场内目标物体的红外辐射能量，红外能量聚焦在光电探测器上并转换为相应的电信号，该信号再经换算转换为被测目标的温度值。

警告

为避免对用户造成人身伤害，请遵照下列指导：

- 在使用测温仪之前，请检查机壳，查看是否有损坏或缺少塑胶件。若有损坏，请勿使用。
- 当屏幕显示电池低电压符号 " " 时，必须立即更换电池。

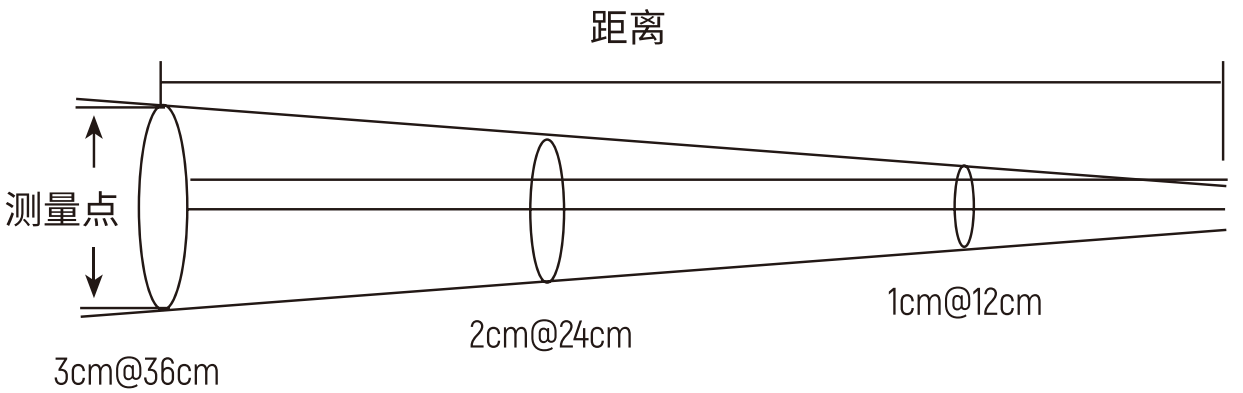
- 若测温仪工作失常，请勿使用。若有疑问，应把测温仪交由专业人员维修。
- 切勿在有爆炸性的气体、蒸汽或灰尘附近使用测温仪。
- 为避免灼伤，请记住在高反射率物体上所测得的温度值可能会低于该物体的实际温度。
- 切勿将激光直接对准眼睛或从反射面间接照射人眼。

为避免损坏测温仪或被测设备，请保护测温仪免受以下影响：

- 弧焊机和感应式加热器等产生的电磁磁场。
- 热冲击〔由于环境温度发生较大或突然改变引起，在使用前要等待 60 分钟使测温仪达到稳定状态〕。
- 请勿将测温仪靠近或放在高温物体上。

视场

目标物体越远，则仪器的测量点越大。距离与测量点大小的关系通常用距离与测量点大小的比值，即 D:S 来表示。当距离为 36cm 时，测量点直径为 3cm，测温仪将显示此直径 3cm 的测量点区域的平均温度。〔光点直径表示 90% 能量圈。〕



距离 : 测量点的直径 = 12：1

注意

确保被测物体大于仪器的测量点。被测物体越小，仪器就应越靠近被测物体。当测量精度很重要时，应确保被测物体不小于仪器测量点的两倍。

规格

测量范围 : -20° C ~ 800° C (-4° F~ 1472° F)

精度指标 :

	温度范围	精度
摄氏温度	-20° C ~ 800° C	±(2.0% 读数 或 2° C)
华氏温度	-4° F ~ 1472° F	±(2.0% 读数 或 3.6° F)

注：当被测温度超过 840° C 时，屏幕将显示 "HI"。
当被测温度低于 -40° C，屏幕将显示 "Lo"。

响应时间： < 500ms

发射率： 调整范围从 0.10 到 1.00(默认值为 0.95)

激光发射器： 输出功率 < 1mW, 激光波长 630 ~ 660nm, 2 级 (II)

工作环境： 工作温度：0° C ~ 40° C
相对湿度：10% ~ 85%, ≤30° C 时无凝结

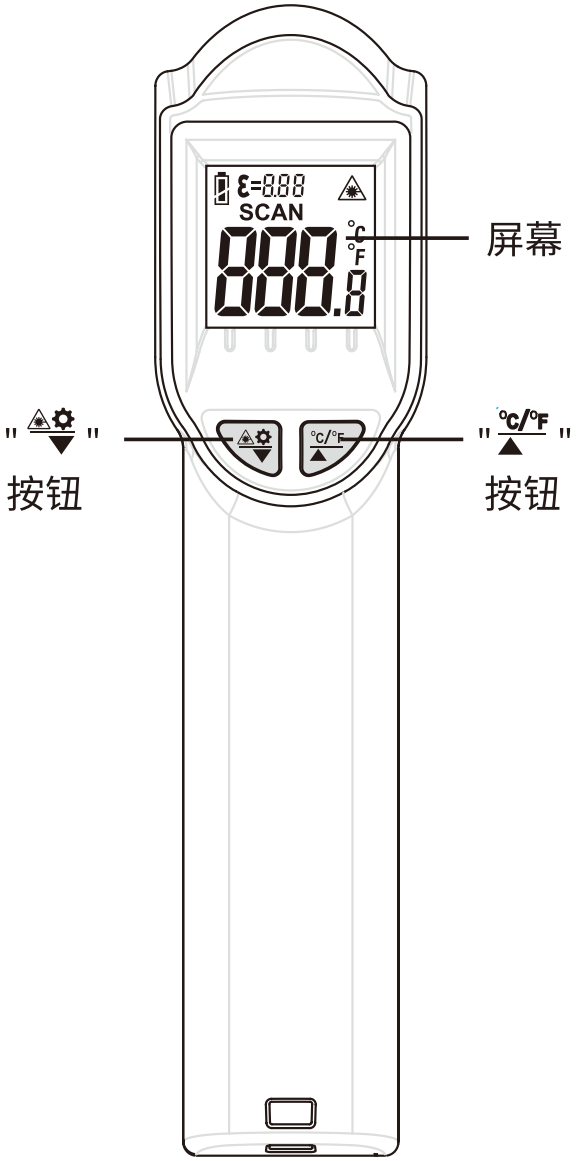
贮存温度： -20° C~ 50° C

重量： 约 165 克 (含电池)

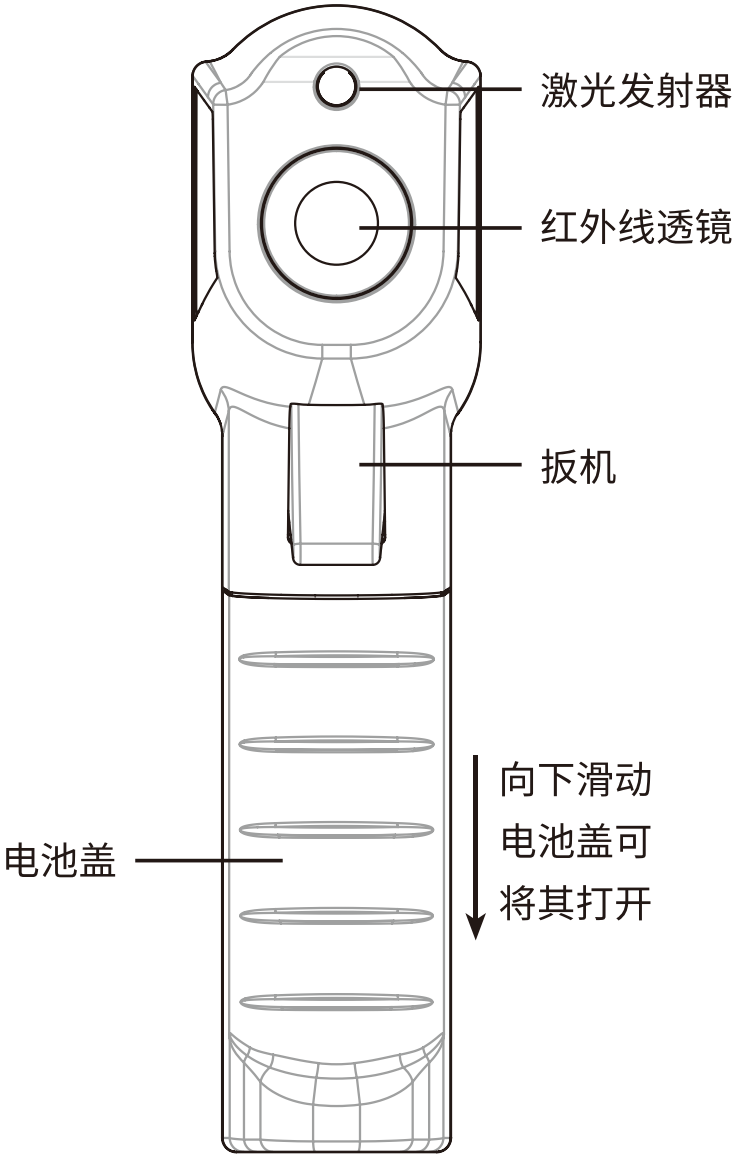
尺寸： 160mm X 118mm X 40mm

电源： 1.5V AAA 电池 , 2 个

距离与视点直径之比 (D : S)： 12 : 1

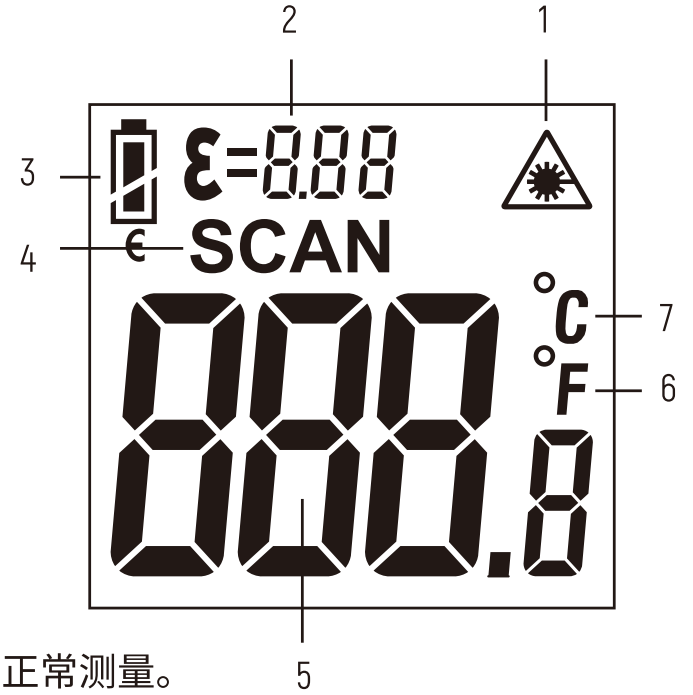


背视图



前视图

液晶屏说明



1. 激光功能指示符，表示激光功能已开启。激开启之后，如果扣动扳机，仪器将发出激光束，以方便定位。
2. 发射率显示区，用于显示仪器当前所设定的发射率。

   提示："ε"表示发射率。
3. 电池电量指示图标。

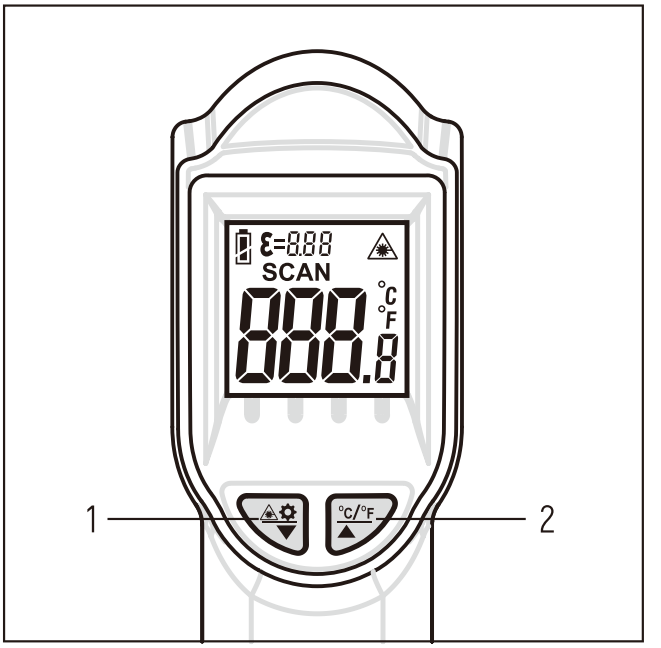
..... 表示电池的电量正常，仪器可以正常测量。

..... 表示电池的电量较低，但仪器仍然可以正常使用一段时间。

..... 表示电池的电量已耗尽，必须立即更换电池。

4. 测量指示符，当仪器测量温度时，该指示符出现在屏幕上。
5. 读数显示区，用于显示当前温度测量读数或最后一次测量的读数。
6. 华氏温度单位
7. 摄氏温度单位

按钮说明



1."▲☼▼"按钮

- 短按该按钮可开启或关闭激光功能。激光功能开启时，屏幕显示"▲"符号作为指示。
- 按住该按钮不放约 2 秒可进入或退出发射率设置模式。
- 在发射率设置模式，短按该按钮可减小发射率设置值。

2."°C/°F▲"按钮

- 按该按钮可在摄氏温度单位和华氏温度单位之间进行切换。
- 在发射率设置模式，按该按钮可增大发射率设置值。

操作说明

基本测量方法

- 握住仪器手柄，将仪器指向待测物体表面。
- 扣动一下仪器扳机以开机。
- 如果要测量温度，请扣住扳机不放至少 1 秒，测量读数将显示在屏幕上。

  注：每次扣动扳机测量温度时，扣住扳机的时间不能小于 1 秒。
- 当仪器进行测量时，"SCAN" 符号会出现在屏幕上。如果激光功能已开启，仪器将发出激光束以方便定位。松开扳机时，仪器停止测量，最后一个测量读数被锁定〔即数据保持〕，"SCAN" 符号消失。
- 停止操作仪器之后约 1 分钟仪器将自动关机。

注意

- **确保被测物体大于仪器的测量点。被测物体越小，仪器就应越靠近被测物体〔参见 " 视场 " 章节的说明〕。当测量精度很重要时，应确保被测物体不小于仪器测量点的两倍。**
- **激光主要用于远距离瞄准，在进行近距离测量时可以将其关闭，这样可节省电池的电量。**
- **仪器不能透过透明物体〔如玻璃〕的表面进行测量，因为它测量的将是该物体表面的温度。**
- **蒸汽、灰尘、烟雾等会影响测量的准确性。**

设置发射率

发射率用于表示材料辐射能量的特性。大多数有机材料和涂有油漆或氧化的表面具有约 0.95 的发射率，因此将发射率设定为 0.95 可满足大约 90% 的测量用途的要求。测量光亮或抛光的金属表面将导致读数不准确。解决方法是用黑胶带或黑色油漆盖住待测表面。当胶带或油漆达到与被覆盖材料相同的温度之后，测定胶带或油漆的表面温度。

参照下一页的表格，使用者可根据被测物体表面的材料类型来设置仪器的发射率。

发射率设置的方法：

- 在开机状态且扳机没被扣住的情况下，按住"ε=" 按钮不放直到 "▲☼▼" 符号闪烁，然后松开 "▲☼▼" 按钮，仪器进入发射率设置模式。
- 根据需要，短按 "▲☼▼" 按钮降低或按 "°C/°F▲" 按钮增大仪器的发射率设定值直到符合要求。

  提示：按住 "°C/°F▲" 按钮不放可快速增大仪器的发射率设定值。当发射率达到最大 1.00 时，按 "°C/°F▲" 按钮将使发射率返回最小值 0.10。
- 设置完成后，按住 "▲☼▼" 按钮不放直到 "ε=" 符号停止闪烁，仪器退出发射率设置模式。使用者也可以扣住扳机退出发射率设置模式并直接进入测量模式。

一些常见物质的发射率见下表：

物质	发射率
沥青	0.90 - 0.98
混凝土	0.94
水泥	0.96
沙子	0.90
泥土	0.92 - 0.96
水	0.92 - 0.96
冰	0.96 - 0.98
雪	0.83
玻璃	0.90 - 0.95
陶瓷	0.90 - 0.94
大理石	0.94
石膏	0.80 - 0.90
灰泥	0.89 - 0.91
砖	0.93 - 0.96

物质	发射率
布〔黑色〕	0.98
人体皮肤	0.98
肥皂泡	0.75 - 0.80
木炭〔粉末〕	0.96
漆器	0.80 - 0.95
漆器〔无光泽〕	0.97
橡胶〔黑色〕	0.94
塑料	0.85 - 0.95
木材	0.90
纸	0.70 - 0.94
铬氧化物	0.81
铜氧化物	0.78
铁氧化物	0.78 - 0.82
纺织品	0.90

保养

镜头清洗

用清洁压缩空气吹掉松散颗粒，轻轻用柔软毛刷刷去残留碎屑，再用潮湿棉花球小心擦洗，棉花球可用水湿润。

注意

不要用溶剂清洗镜头，切勿使用研磨剂或溶剂。

外壳清洁

用蘸有肥皂水的潮湿软布，切勿使用研磨剂或溶剂。

注意

不要将测温仪浸在水里，不要让任何液体进入仪器内部。

电池的更换

当 " " 符号出现在屏幕上时，表示电池的电量水平低，必须立即更换电池。等仪器自动关机之后，向下滑动电池盖将其取下，用 2 个新的 1.5V AAA 电池更换旧电池，确保电池极性正确。重新装好电池盖 .

开箱检查

包装盒内容

测温仪	1 台
保修卡	1 张
使用说明书	1 本
1.5V AAA 电池	2 节

说明

- 本公司保留对说明书内容修改的权利。
- 本公司不负责任何由于使用时引起的其它损失。
- 本说明书内容不能作为将产品用做特殊用途的理由。

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Introduction

This instrument is a hand-held, professional non-contact infrared thermometer. It determines an object's surface temperature by measuring the amount of infrared energy radiated by the object's surface. It is easy to use and features durable construction, high accuracy, wide measurement range, sighting laser beam with crosssection of one big dot and eight small surrounding dots, data hold, backlight, and automatic power-off.

How The Thermometer Works

The infrared thermometer consists of optical system, photo detector, signal amplifier, signal processing and display output system, and etc. The optical system collects the infrared radiation energy of the measured area, then this energy is focused onto the photo detector and changed into electric signal, which is further converted into temperature value shown on the display.

Safety Information

Warning

To avoid possible personal injury, follow these guidelines:

- Before using the thermometer, inspect the case. Do not use the thermometer if it appears damaged.
  Look for cracks or missing plastic.
- When the low battery indicator "▯" appears, replace the batteries immediately.

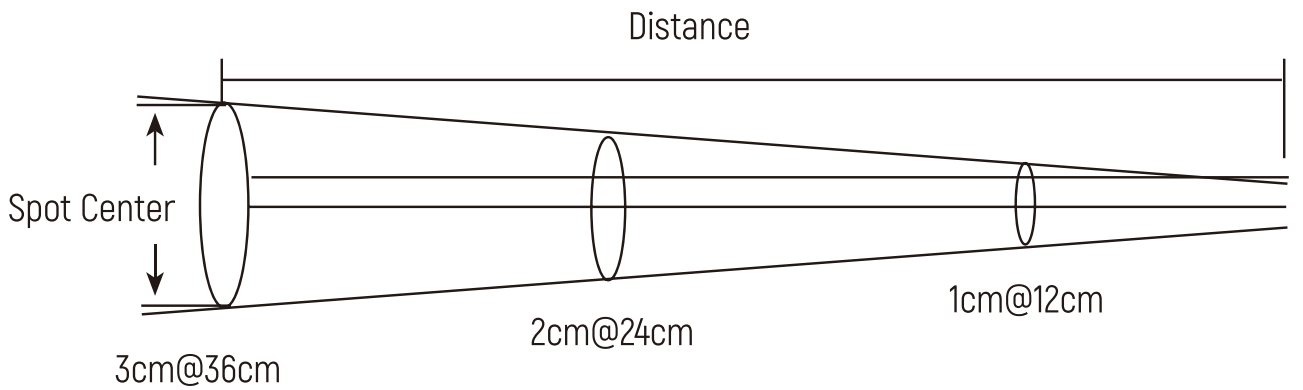
- Do not use the thermometer if it operates abnormally. When in doubt, have the thermometer serviced.
- Do not operate the thermometer where explosive gas, vapor ordust is present.
- To avoid heat injury, please keep in mind that the measurement result of an object with high reflectivity may be lower than the actual temperature of this object.
- Do not point the laser beam toward anyone's eye or allow the laser beam to strike the eye from a reflective surface.

The thermometer should be protected from the following:

- Electro magnetic fields (created by arc welders, induction heaters and similar items.)
- Thermal shock (caused by large or abrupt ambient temperature changes. Allow 60 minutes for the thermometer to stabilize beforeuse.)
- Do not leave the thermometer on or near any high temperature object.

Field Of View

As the distance (D) from the object being measured increases, the spot size (S) of the area measured by the thermometer becomes larger. This relationship between distance and spot size is normally expressed as the distance to spot, or D :S ratio, which is shown in the following figure. At a distance of 36cm, the spot size would be 3cm in diameter. The thermometer will display the average temperature across the spot area. The spot sizes indicate 90% encircled energy. See the following figure.



Distance to Spot size = 12 : 1

Note

Make sure that the object to be measured is larger than the thermometer's spot size. The smaller the object, the closer you should be to it.

When accuracy is critical, make sure that the object is at least twice as large as the spot size.

Specification

Temperature Range: -20° C to 800° C (-4° F to 1472° F)

Accuracy:

	Range	Accuracy
Celsius	-20° C to 800° C	±2° C or 2% (whichever is greater)
Fahrenheit	-4° F to 1472° F	±3.6° F or 2% (whichever is greater)

Note: When the temperature being measured is higher than 840° C,the display will show " HI ".
When the temperature being measured is lower than -40° C,the display will show " Lo ".

Response Time: < 500ms

Emissivity: Adjustable from 0.10 to 1.00 (0.95 default value)

Diode Laser: Output < 1mW, 630 ~ 660nm, class 2 (II)

Operating Environment: Temperature: 0° C to 40° C
Relative humidity: 10% to 85% RH, noncondensing up to 30° C

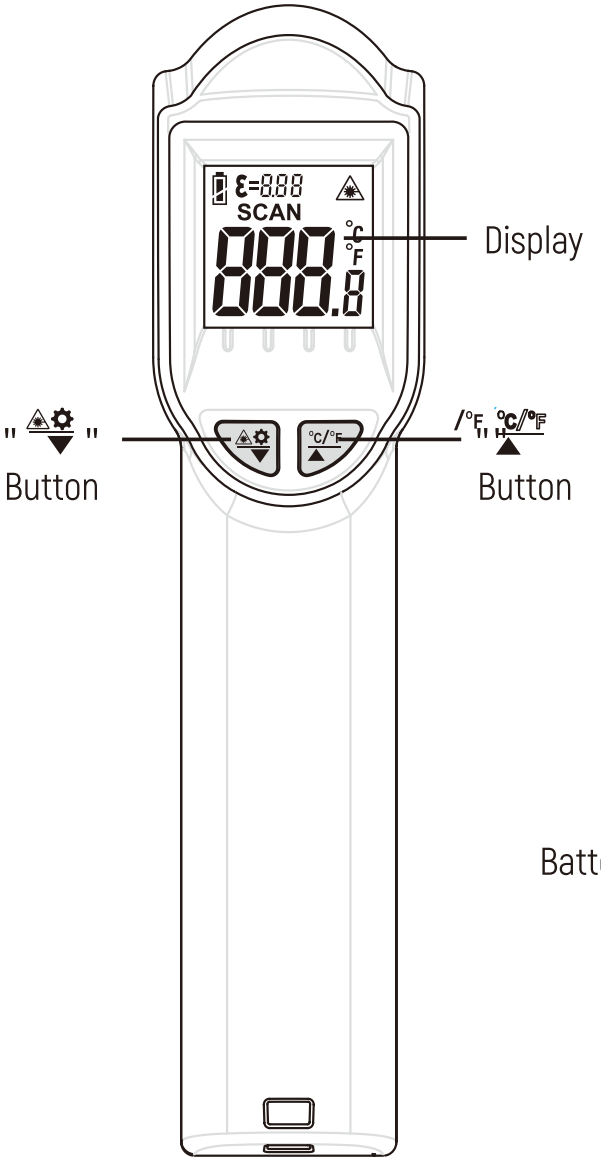
Storage Temperature: -20° C to 50° C

Weight: About 165g (including battery)

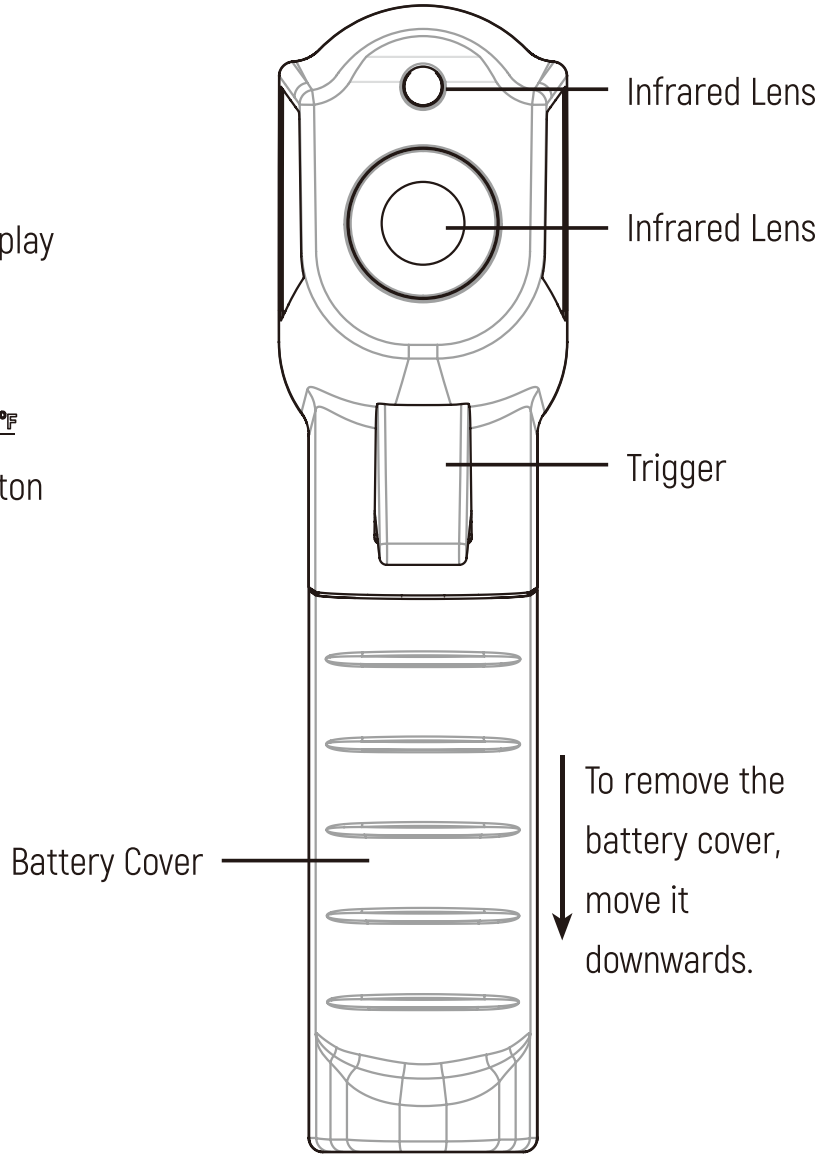
Size: 160mm X 118mm X 40mm

Battery: 1.5V battery, AAA or equivalent, 2 pieces

Distance to Spot Ratio: 12 : 1

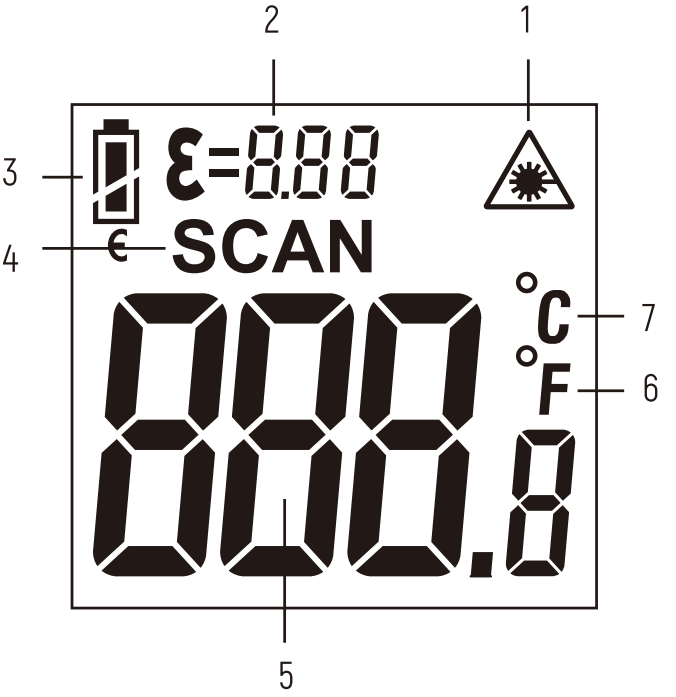


Back View



Front View

Screen Introduction



1. Laser function indicator which is displayed when the laser function is enabled. When this indicator is displayed, the laser pointer will emit a laser beam when you pull the trigger.
2. Emissivity display which shows the present emissivity setting value.

   Tip: The symbol " ε " means " Emissivity ".
3. Battery level indicator.

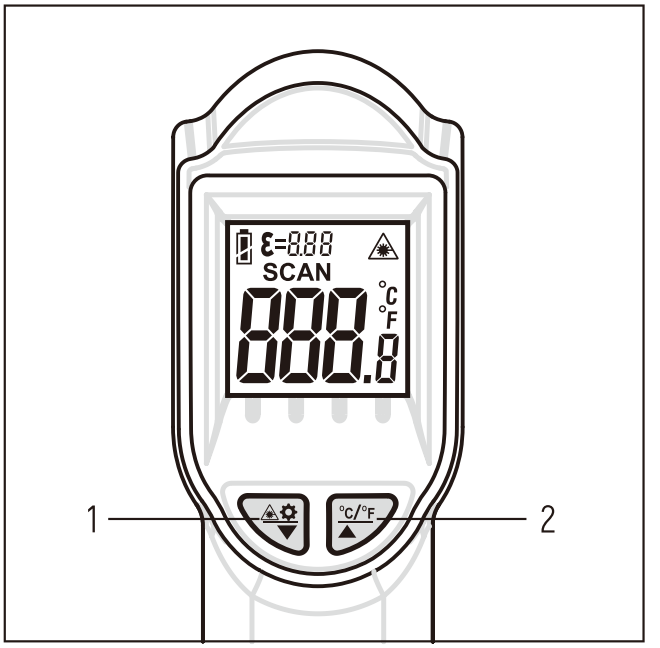
..... Indicates that the batteries are high and measurements are possible.

..... Indicates that the batteries are low but the thermometer can still work normally for some time.

..... Indicates that the batteries are exhausted and must be replaced immediately.

4. Measurement indicator which is present on the display when the thermometer is making measure ment.
5. Reading display area which shows the present reading or the lastreading.
6. Unit of fahrenheit temperature.
7. Unit of celsius temperature.

Button Instructions



1. "▲☼/▼" Button

- Briefly press this "▲☼/▼" button to enable or disable the laser function. When the laser function is enabled, the symbol "▲" is shown on the display as an indicatior.
- Press and hold down this "▲☼/▼" button for about 2 secs to enter or exit the emissivity setting mode.
- In the emissivity setting mode, briefly press this "▲☼/▼" button to decrease the emissivity setting value.

2." °C/°F/▲ " Button

- Press this "°C/°F/▲" button to toggle between ° C and ° F.
- In the emissivity setting mode, press this "°C/°F/▲" button to increase the emissivity setting value.

Operating Instructions

Basic Measurement Procedure

- Hold the thermometer by its handle, and point it toward the surface to be measured.
- Press the trigger briefly to turn on the thermometer.
- To make measurement, press and hold the trigger for at least 1 sec; reading (measurement result) will be shown on the display.

  Note: Each time you press the trigger to make measurement, you must press it for at least 1 sec.
- During measurement, the symbol "SCAN" is present on the display, and if the laser function has been enabled, the laser pointer will emit a laser beam for you to easily locate the target area.

  When you release the trigger, the measurement stops and the last reading is held on the display and the symbol "SCAN" disappears.
- The thermometer will turn off automatically if you have not operated the thermometer for about 1 minute.

Note

- **Make sure that the target surface is larger than the thermometer's spot size. The smaller the target surface, the closer you should be to it (see the " FIELD OF VIEW " section). When accuracy is critical, make sure the target is at least twice as large as the spot size.**
- **Laser beam is mainly used to locate far object. To save battery power, you can disable the laser function when you measure near object.**
- **The thermometer can not measure through transparent surfaces such as glass. It will measure the surface temperature of the glass instead.**
- **Steam, dust, smoke, etc., can prevent accurate measurement by interfering with the energy emitted from the target.**

Emissivity / Setting Emissivity

Emissivity describes the energy-emitting characteristics of materials. Most (90% of typical applications) organic materials and painted or oxidized surfaces have an emissivity of 0.95 (preset in the thermometer). Inaccurate readings will result from measuring shiny or polished metal surfaces. To compensate, cover the surface to be measured with masking tape or flat black paint. Allow time for the tape or paint to reach the same temperature as the surface beneath it. Measure the temperature of the tape or painted surface.

The table on the next page shows the emissivities of some common materials. You can adjust the emissivity setting value of thermometer to match the material of the surface to be measured.

How to Set Emissivity

- With the thermometer on, press and hold down the " ▼ " button for about 2 secs until " ε= " flashes on the display, then release the button. Now the thermometer is in emissivity setting mode.
- You can briefly press the " ▼ " button to decrease the emissivity setting value or press the "°C/°F ▲ " button toincrease the emissivity setting value. Adjust the emissivity setting value until it matches the material of the object surface to be tested or meets your requirement.
- After you finish setting emissivity, press and hold down the " ▼ " button until " ε= " stops flashing.

  Now the thermometer has exited the emissivity setting mode. You can also exit the emissivity setting mode by pressing the trigger; the thermeter will return to normal operation.

Emissivity Values

Substance	Emissivity
Asphalt	0.90 - 0.98
Concrete	0.94
Cement	0.96
Sand	0.90
Earth	0.92 - 0.96
Water	0.92 - 0.96
Ice	0.96 - 0.98
Snow	0.83
Glass	0.90 - 0.95
Ceramic	0.90 - 0.94
Marble	0.94
Plaster	0.80 - 0.90
Mortar	0.89 - 0.91
Brick	0.93 - 0.96

Substance	Emissivity
Cloth (black)	0.98
Human skin	0.98
Lather	0.75 - 0.80
Charcoal(powder)	0.96
Lacquer	0.80 - 0.95
Lacquer (matt)	0.97
Rubber (black)	0.94
Plastic	0.85 - 0.95
Timber	0.90
Paper	0.70 - 0.94
Chromium oxides	0.81
Copper oxides	0.78
Iron oxides	0.78 - 0.82
Textiles	0.90

Maintenance

To Clean the Lens

Blow off loose particles using clean compressed air. Then use a soft hair brush to brush off the remaining debris. And then carefully wipe the surface with a moist cotton swab. The swab may be moistened with water. Don't use abrasive or solvent.

To Clean the Case

Use a damp soft cloth with soapy water. Don't use abrasive or solvent.

Note

Do not immerse the thermometer in water, and do not let any liquid enter the case.

Battery Replacement

When the low battery indicator " " shows on the display, the batteries are exhausted and must be replaced immediately. Wait until the thermometer turns off automatically, then remove the battery cover by sliding it downwards. Replace the exhausted batteries with new ones of the same type (1.5V battery, AAA or equivalent), make sure that the polarity connections are correct. Reinstall the battery cover.

Unpacking And Inspection

Packing including

Thermometer	1 pc
Warranty card	1 pc
Manual	1 pc
1.5V AAA battery	2 pcs

Note

- This manual is subject to change without notice.
- Our company will not take the other responsibilities for any loss.
- The contents of this manual can not be used as the reason to use the thermometer for any special application.

适用型号 / Model: **03032**

版本号 / Version No: **V_SC_03032_0623**

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