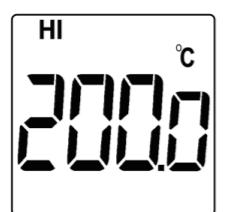


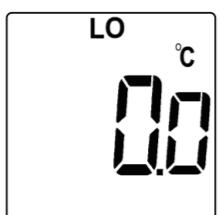
High Alarm Limit Setting

In the HOLD interface, long press the "MODE" button to enter the high alarm limit setting interface. The user can use "▼" or "▲" to adjust. Short pressing will add or subtract 1 to the value each time, and long pressing will add or subtract 10 each second.



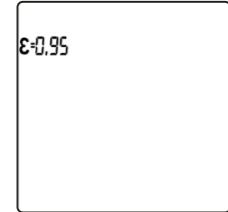
Low Alarm Limit Setting

In the HOLD interface, long press and then short press the "MODE" button once to enter the low alarm limit setting interface. The user can use "▼" or "▲" to adjust. Short pressing will add or subtract 1 to the value each time, and long pressing will add or subtract 10 each second.



Emissivity Setting

In the HOLD interface, long press the "MODE" button once and then short press the "MODE" button twice to enter the emissivity setting interface. The user can use "▼" or "▲" to adjust. Short pressing will add or subtract 0.01 to the value each time, and long pressing will add or subtract 0.1 each second.



Temperature Unit Setting

In the HOLD interface, long press the "MODE" button once and then short press the "MODE" button three times to enter the temperature unit setting interface. The user can use "▼" or "▲" to convert the unit °C/°F.

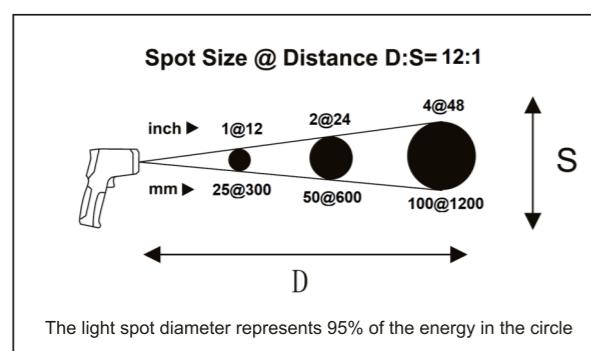
Sound Alarm Setting

In the HOLD interface, long press the "MODE" button once and then short press the "MODE" button four times to enter the sound alarm setting interface. The user can use "▼" or "▲" to turn on/off this function.

D: S (Distance to Spot Ratio)

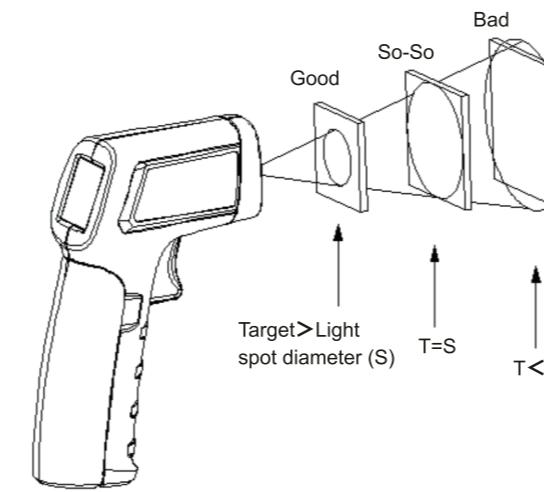
As the distance (D) between the thermometer and the measured target increases, the light spot diameter (S) of the measured area also increases.

The relationship between measurement distance and light spot diameter is shown in the figure below.



Field of View

When measuring, make sure that the measured target is larger than the light spot diameter. The smaller the target, the closer the test distance should be (refer to D: S for the detailed light spot diameter). It is recommended that the measured target be larger than twice the light spot diameter of the thermometer.



Emissivity

Emissivity represents the material energy radiation. The emissivity of most organic materials, painted or oxidized surfaces is about 0.95. The user can use masking tapes or flat paints to cover the metal surface, use the high emissivity setting, and then wait for a period of time to make the surface temperatures of the tapes/flat paints and the covered object the same. At this point, the surface temperature of the tapes/flat paints is equal to the metal surface temperature. The following table shows the total emissivity ϵ of some metals and non-metals.

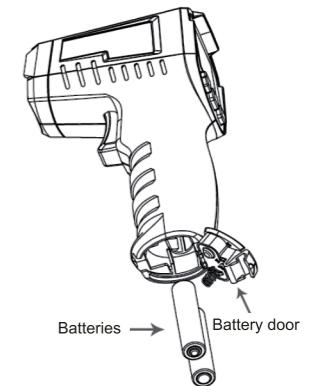
Measured surface	Emissivity
Metals	
Aluminum Oxide	0.2-0.4
A3003 Alloy Oxide Crude	0.3 0.1-0.3
Brass Polishing Oxide	0.3 0.5
Cuprum Oxide Electrical terminal board	0.4-0.8 0.6
Hastelloy Alloy	0.3-0.8
Inconel Oxide Abrasive blasting Electropolishing	0.7-0.95 0.3-0.6 0.15
Ferrum Oxide Rusting	0.5-0.9 0.5-0.7
Ferrum (casting) Oxide Non-Oxide Casting	0.6-0.95 0.2 0.2-0.3
Ferrum (forging) Passivating	0.9
Plumbum Crude Oxide	0.4 0.2-0.6
Molybdenum Oxide	0.2-0.6
Nickel Oxide	0.2-0.5
Platinum Black	0.9
Steel Cold rolling Burnishing Polishing	0.7-0.9 0.4-0.6 0.1

Zinc Oxide	0.1
Non-Metals	
Asbestos	0.95
Asphalt	0.95
Basalt	0.7
Carbon	
Non-Oxide Graphite Carborundum	0.8-0.9 0.7-0.8 0.9
Ceramic	0.95
Clay	0.95
Concrete	0.95
Cloth	0.9
Glass	
Convex glass Smooth glass Nonex	0.76-0.8 0.92-0.94 0.78-0.82
Sheet material	0.96
Gypsum	0.8-0.95
Ice	0.98
Limestone	0.98
Paper	0.95
Plastic	0.95
Water	0.93
Soil	0.9-0.98
Wood	0.9-0.95

Maintenance

Cleaning

Blow away the fallen particles with clean compressed air, carefully wipe the lens surface with a moist swab, and clean the shell with a moist sponge or soft cloth. Be careful not to rinse with water or immerse it in water.



Replace Batteries

Install or replace two 1.5V batteries according to the following steps:

1. Remove the battery door
2. Install the batteries (pay attention to the polarity)
3. Close the battery door

Troubleshooting

Phenomenon	Cause	Measure
Display OL	Measured value > maximum range	Stop measuring
Display -OL	Measured value < minimum range	Stop measuring
Display Err (startup)	Exceed the minimum or maximum operating temperature	Place the thermometer at 0°C-50°C (32°F-122°F) for 30 minutes
Battery symbol flashes	Low battery	Replace batteries
Laser is not working or dark	Low battery	Replace batteries
Inaccurate measurement	Unmatched emissivity, too far measurement distance, diameter of the measurement target < 20mm	Refer to Field of View, D:S and other instructions in this manual