MESTEK IR01C

Infrared Thermometer

User Manual

Optimised for Pizza Ovens & Wood-Fired Ovens

1. Safety Information

⚠️ **IMPORTANT WARNINGS – Please read before first use**

- Do NOT point the laser directly at eyes or at reflective surfaces.
- Do not use near steam, dust or smoke (e.g. a heavily smoking oven) – measurements may be inaccurate.
- The thermometer cannot accurately measure transparent surfaces (glass, plastic).
- Keep out of reach of children.
- Do not submerge in water.
- Do not use solvent to clean the lens.
- Do NOT place the thermometer on or near hot objects.

ℹ️ **Thermal Shock (important for wood-fired oven applications)**

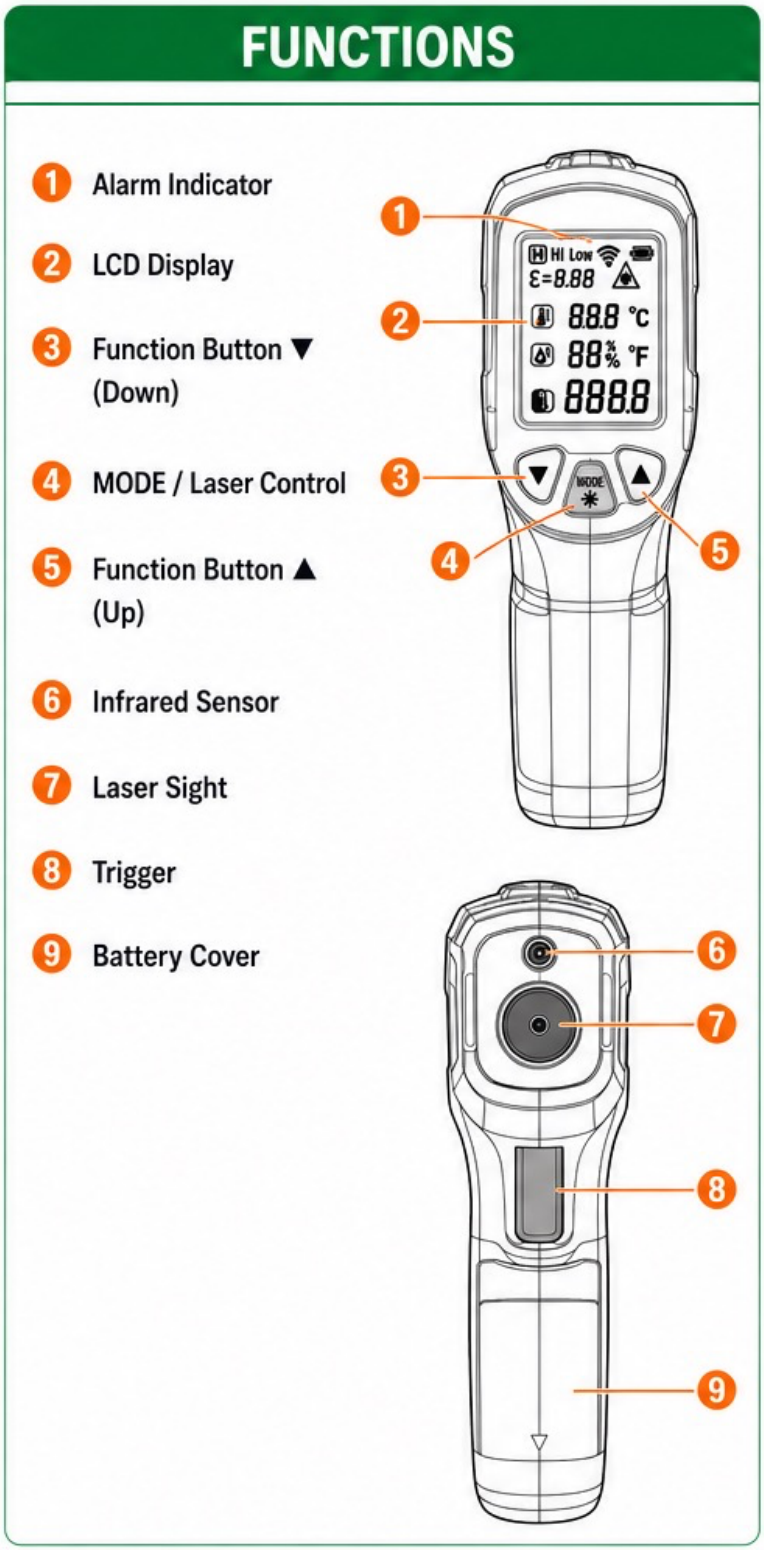
- When there are abrupt changes in ambient temperature (e.g. cold room → hot oven), wait 30 minutes for the device to acclimatise.
- This prevents measurement errors and protects the device.

2. Package Contents & Device Overview

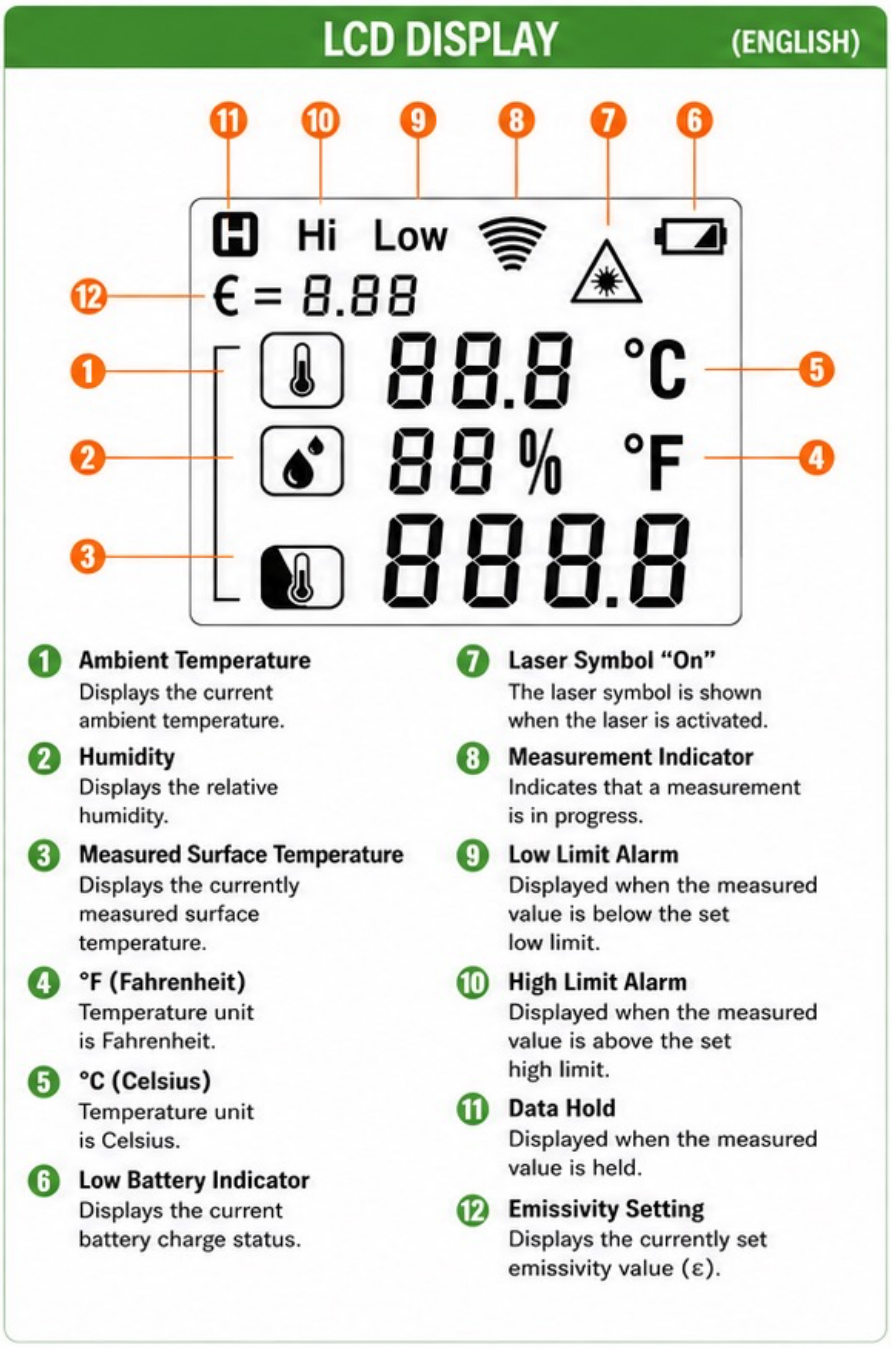
Package contents:

- 1× Infrared Thermometer MESTEK IR01C
- 1× Plastic carry case
- 1× User manual

Controls


FUNCTIONS
1 Alarm Indicator
2 LCD Display
3 Function Button ▼ (Down)
4 MODE / Laser Control
5 Function Button ▲ (Up)
6 Infrared Sensor
7 Laser Sight
8 Trigger
9 Battery Cover
HI Low
ε=0.88
°C
°F
MODE

LCD Display Overview



3. Quick Start – First Measurement

1. Open the battery cover and insert 2× AAA 1.5V batteries (observe polarity).
2. Aim the device at the object to be measured.
3. Press and hold the trigger → continuous measurement runs.
4. Release the trigger → the last reading stays on the display.
5. The device switches off automatically after 30 seconds of inactivity.

4. Temperature Measurement in Pizza Ovens & Wood-Fired Ovens

Why non-contact measurement?

Infrared thermometers are ideal for pizza ovens because they measure the temperature of the oven floor (firebrick, stone, steel) instantly and without contact – even with the door open and from a safe distance.

Setting emissivity correctly (critical for accuracy!)

Emissivity describes how well a surface radiates heat. Wrong emissivity = wrong measurement. Default setting of the device: 0.95.

Material	Condition	Emissivity
Firebrick / refractory clay	Typical	0.90 – 0.95
Firebrick / refractory clay	New	0.85
Pizza stone (unglazed)	–	0.90 – 0.95
Steel (pizza steel)	Cold-rolled	0.70 – 0.90
Cast iron (fire grate)	Oxidised	0.60 – 0.95
Concrete / cement (oven floor)	–	0.95
Charcoal / embers	–	0.80 – 0.90
Stainless steel (grill, oven interior)	Polished	0.10 – 0.20
Clay / ceramic (oven)	–	0.95

Important for shiny metal surfaces (stainless steel, polished steel)

- Shiny metal surfaces have a very low emissivity (0.1–0.2).
- The device may reflect ambient heat and display values that are TOO HIGH.
- Solution: stick a small piece of black adhesive tape on the measurement spot (emissivity ~0.95) or adjust the emissivity manually.

Setting emissivity – step by step

6. Press and hold the MODE button for 2 seconds.
7. Press MODE repeatedly until the emissivity symbol (ε=) flashes on the display.
8. Use ▲/▼ to set the desired value (e.g. 0.95 for firebrick).
9. Hold ▲/▼ for faster adjustment.
10. Press the trigger or hold MODE to confirm.

Distance and measurement spot (D:S ratio 12:1)

The device has a D:S ratio of 12:1. This means: at 12 cm distance, the measurement spot is 1 cm in diameter. At 60 cm distance, the measurement spot is 5 cm in diameter.

> ℹ️ **Recommended distances for the pizza oven**
>
> • Distance 20–30 cm: measurement spot approx. 1.7–2.5 cm – ideal for precise individual measurements.
> • Distance 40–60 cm: measurement spot approx. 3–5 cm – good for an overview of oven temperature.
> • The smaller the target, the closer the device must be.
> • For accurate results: target size must be at least twice the size of the measurement spot.

Reference values for pizza ovens

Application	Value
Neapolitan pizza (Napoletana)	430–480°C oven floor
Pizza Romana / Teglia	300–370°C oven floor
Bread / Focaccia	220–280°C oven floor
Preheating the stone	min. 45–60 min. preheat
Checking even heat	3–5 measurement points on floor

5. Calibration – Ensuring Accuracy

Device calibration

The MESTEK IR01C is factory-calibrated. Re-calibration by the user is not possible or required. For everyday use (pizza oven, cooking, trades), the factory accuracy is sufficient:

Range	Accuracy
0°C to 550°C	±(1.5% of reading + 2°C)
−50°C to 0°C	±3°C
Ambient temperature 0–45°C	±1.0°C

Self-check: Is my thermometer accurate?

Use this simple method to verify accuracy at any time:

Ice point test (0°C reference)

- Fill a glass with crushed ice and a little water (ice water, 0°C).
- Wait 1–2 minutes for the mixture to stabilise.
- Aim the thermometer at the water surface (not the glass/ice!), press the trigger.
- Expected value: 0°C (±3°C tolerance per specification).
- Emissivity for water: 0.93 (set briefly, then return to 0.95).

Boiling point test (100°C reference, at sea level)

- Bring water to the boil.
- Aim the thermometer at the water surface (boiling water), approx. 10–15 cm distance.
- Expected value: ~97–103°C (tolerance ±1.5% + 2°C).
- Note: In Switzerland at approx. 500 m altitude, water boils at ~98.2°C – this is normal.
- Emissivity for water: 0.93.

Body temperature comparison (not for medical use)

- Measure the palm of the hand: expected value 32–36°C (skin temperature, not core body temperature).
- This thermometer is NOT a medical device and is not suitable for measuring fever.

Tips for consistent measurements

- Always use the same distance and angle (perpendicular to the surface) for comparative measurements.
- Allow 30 minutes acclimatisation time after a large temperature change.
- Keep the lens clean – dirt distorts measurements.
- No measurements through glass panes, steam or smoke.
- When measuring in a pizza oven: briefly open the door, measure immediately, close the door.

6. All Settings at a Glance

Turning the laser on/off

Briefly press the MODE button (in normal operation) → laser on/off. The laser symbol appears on the display when active.

High-Limit Alarm (upper temperature limit)

When the measured temperature exceeds the set value, the red alarm LED lights up and "OL" appears on the display.

11. Press and hold MODE for 2 seconds.
12. Press MODE until "Hi" appears on the display.
13. Set ▲/▼ to the desired upper limit (e.g. 500°C for pizza oven overheat alarm).
14. Press the trigger or hold MODE to confirm.

Low-Limit Alarm (lower temperature limit)

15. Press and hold MODE for 2 seconds.
16. Press MODE until "Low" appears on the display.
17. Set ▲/▼ to the desired lower limit (e.g. 380°C = pizza stone not yet hot enough).
18. Press the trigger or hold MODE to confirm.

Switching temperature unit (°C / °F)

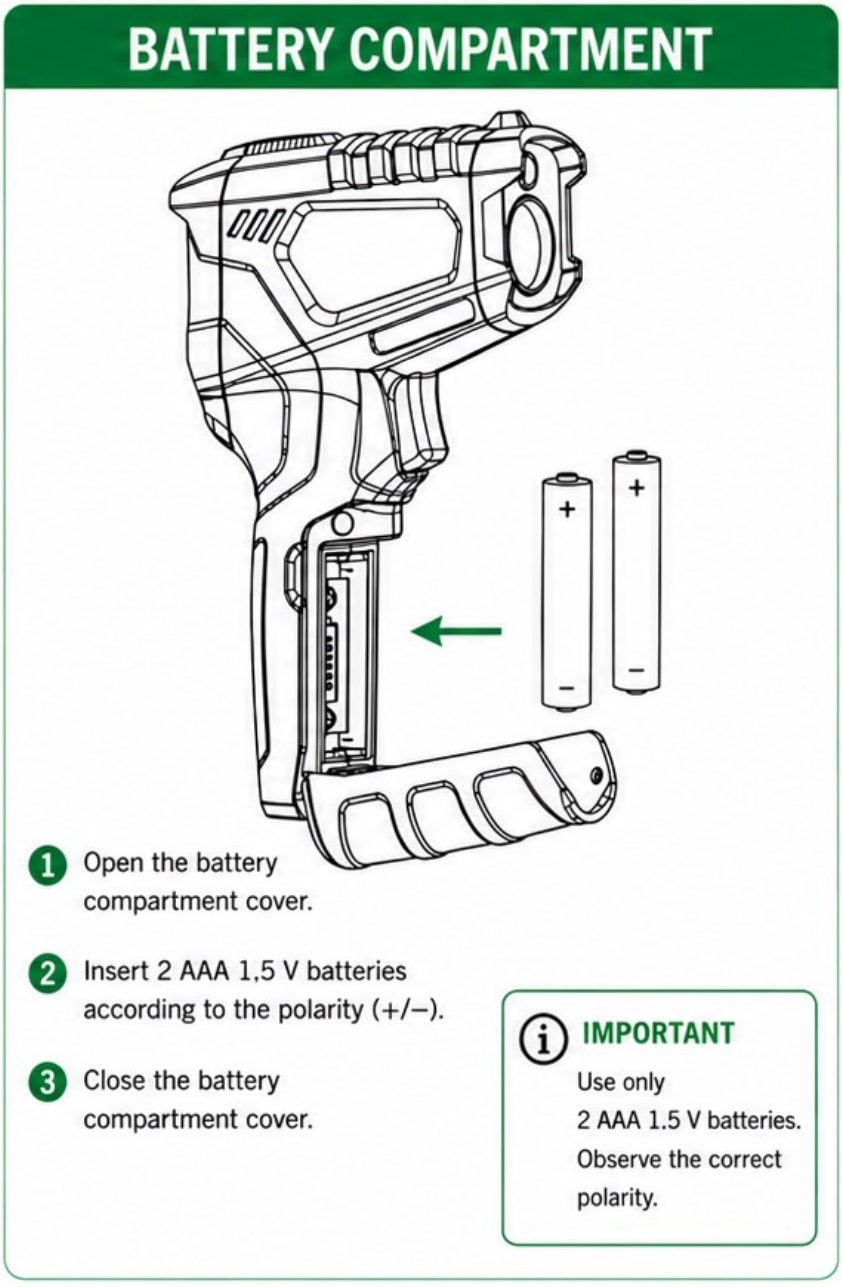
19. Press and hold MODE for 2 seconds.
20. Press MODE until °C or °F appears on the display.
21. Press ▲/▼ to switch between °C and °F.
22. Press the trigger to confirm.

Exiting settings mode

Press the trigger or hold MODE – returns to normal operation.

7. Battery Replacement

When the battery symbol appears on the display, replace the batteries immediately.



⚠ Battery notes

- Do not mix different battery types (alkaline, zinc-carbon, etc.).
- Do not mix old and new batteries.
- If not used for an extended period, remove batteries and store separately.
- Remove dead batteries immediately – leaking batteries can damage the device.

8. Care & Maintenance

Cleaning the lens

Blow off loose particles with clean compressed air. Gently wipe the surface with a slightly damp cotton cloth. Do not use solvent.

Cleaning the housing

Clean with a damp sponge or cloth and a little soap. Do not submerge in water.

9. Technical Specifications

Property	Value
Measurement range (surface)	-50°C to 550°C / -58°F to 1022°F
Measurement range (ambient)	-10°C to 60°C / -14°F to 140°F
Humidity measurement	0% to 100% RH
Surface accuracy (0–550°C)	±(1.5% of reading + 2°C/4°F)
Accuracy below 0°C	±3°C
Ambient temperature accuracy	±1.0°C (0–45°C)
Humidity accuracy	±4.0% RH (20–80%)
D:S ratio (optics)	12:1
Emissivity	0.1 to 1.0 (adjustable)
Spectral response	8 to 14 µm
Response time	< 0.5 seconds
Auto power-off	30 seconds
Laser class	Class 2, < 1mW, 620–690nm
Operating temperature	0°C to 40°C
Storage temperature	-10°C to 60°C
Power supply	2× AAA 1.5V batteries
Weight	approx. 108g
Dimensions	150 × 94 × 40mm
Compliance	CE, RoHS, EN60825-1:2014

10. Troubleshooting

Problem	Solution
Device does not turn on	Check / replace batteries. Ensure correct polarity.
Reading too low for a hot oven	Emissivity set too low. Use 0.90–0.95 for firebrick.
Reading fluctuates strongly	Steam, smoke or movement in measurement area. Adjust distance and angle.
"OL" on the display	Measured value above or below the set alarm limit.
Battery symbol despite new batteries	Wrong battery type or mixed brands. Replace the complete set.
Implausible values on stainless steel	Reduce emissivity to 0.10–0.20 or apply black adhesive tape.
Device does not respond to buttons	Settings mode active? Press trigger to exit.