

Non-Contact Infrared Thermometer



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SAFETY INFORMATION

Please read these instructions carefully before using this instrument and keep the instructions and the thermometer in a safe place.

\land Warning

Warning identifies conditions and actions that pose hazards to the user. To avoid personal injury, follow these guidelines:

- Do not point laser A directly at eye or indirectly off reflective surfaces.
- Replace the batteries as soon as the low-battery indicator () appears.
- Do not operate the thermometer around explosive gas, vapor, or dust.
- To avoid a burn hazard or fire, know that reflective objects may be much hotter than the indicated temperature reading.
- Do not leave the thermometer on or near objects of high temperature.
- Use of controls or adjustments or performance of procedures other than those specified, may result in hazardous laser radiation exposure.
- If the thermometer is used in a manner not specified by the manufacturer, the protection provided by the thermometer may be impaired.

- Never immerse the thermometer into water or other liquids and follow the Cleaning section for maintenance.
- Store and Operate the thermometer as per stated in the manual.
- Do not take temperature with this product near heat sources such as in direct sunlight, near a fireplace or stove.
- Do not use this product if it is damaged and/or not functioning properly, contact your distributor for support.

A Caution

To avoid damaging the thermometer or the equipment under test, protect them from the following:

- EMF (electro-magnetic fields) from arc welders, induction heaters, etc.
- · Static electricity
- Thermal shock (caused by large or abrupt ambient temperature changes- for highest accuracy, allow 30 minutes for thermometer to stabilize before use).
- Avoid touching and/or scratching the infrared sensor lens.



SYMBOLS AND MARKINGS

A Warning : Laser



- 1) IR Sensor
- 2) Trigger
- 3) Battery Door
- 4) LCD
- 5) Push Buttons

Display



No.	Symbol	Meaning
1	RT	Room temperature
	MAX	Maximum reading
	MIN	Minimum reading
	EMS	Emissivity

	SET	Select between Degrees Celsius and Degrees Fahrenheit
2	Data	Data Logging.
3	Q [*]	Display backlight is on
4		Laser is on
5 5	HOLD	Display HOLD is enabled. Display freezes present reading
6	SCAN	The Thermometer is scanning the temperature
		Replace Battery.
7	°C / °F	Indicating Degrees Fahrenheit or Degrees Celsius

Push Buttons

Button	Mode	Function
		Press to turn the laser on and off

MODE		Switch between RT (room temperature), MAX, MIN, EMS (emissivity setting) and Set [selecting of °C and °F]
		Switch between RT (room
		(emissivity setting).
Ø		Press to turn the display backlight on and off
\bigcirc	Set	Switch between °C and °F
	EMS	Press to increase or decrease the emissivity

HOW THE THERMOMETER FUNCTIONS

Infrared thermometers measure the surface temperature of an object. The thermometer's optics sense emitted, reflected, and transmitted energy, which is collected and focused onto a detector. The unit's electronics translate the signal into a temperature reading which the unit displays (see following Figure).



OPERATING THE THERMOMETER

A. Temperature Measurement

To measure temperature, point the thermometer at an object and pull the Trigger. You can use the laser pointer to help aim the thermometer. Be sure to consider distance-to-spot size ratio and field of view (see "Distance and Spot Size" and "Field of View"). The temperature appears on the display. The measured value will be kept on the display for 7 seconds after the trigger is released.

Note:

The laser is used for aiming purposes only and is not related to temperature measurement.

B. Locating a Hot or Cold Spot

To find a hot or cold spot, aim the thermometer outside the desired area. Then, slowly scan across the area with an up and down motion until you locate the hot or cold spot.



C. Distance and Spot Size

As the distance (D) from the object being measured increases, the spot size (S) of the area measured by the unit becomes larger. The relationship between distance and spot size (D:S) for each unit is shown in the following Figure. The spot sizes indicate 90 % encircled energy.



D. Field of View

For accurate measurements, make sure that the target is larger than the unit's spot size. The smaller the target, the closer you should be to it (see following Figure).



E. Emissivity

Emissivity describes the energy-emitting characteristics of materials. Most organic materials and painted or oxidized surfaces have an emissivity of approximately 0.95, the default setting for the thermometer.

To compensate for inaccurate readings that may result from measuring shiny metal surfaces, you can cover the surface to be measured with electrical tape or flat black paint (<150°C/302°F). 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.

If you cannot paint or use tape, then you can improve the accuracy of your measurements by either numerically adjusting emissivity or by using the Emissivity Menu to access a table of some common materials. The thermometers have numerically adjustable emissivity from 0.10 to 1.00 that can be used in conjunction with the emissivities.

Material	Value	Material	Value
	Me	etals	
Aluminum Oxidized	0.2-0.4	<i>Iron Wrought</i> Dull	0.9
Alloy A3003 Oxidized Roughened	0.3 0.1-0.3	Lead Rough Oxidized	0.4 0.2-0.6
Brass Brunished Oxidized	0.3 0.5	<i>Molydbenum</i> Oxidized	0.2-0.6
Copper Oxidized	0.4-0.8	Nickel Oxidized	0.2-0.5

Following table is a list of the emissivity values for different surfaces:

Haynes		Platinum Black	
Alloy	0.3-0.8		0.9
<i>Inconel</i> Oxidized Sandblasted Electoropolished	0.7-0.95 0.3-0.6 0.15	Steel Cold-Rolled Ground Sheet Polished Sheet	0.7-0.9 0.4-0.6 0.1
Iron Oxidized Rusted	0.5-0.9 0.5-0.7	Zinc Oxidized	0.1
<i>Iron Cast</i> Oxidized Unoxidized Molten	0.6-0.95 0.2 0.2-0.3		
	Non-	Metals	
Asbestos	0.95	Glass (Plate)	0.85
Asphalt	0.95	Gravel	0.95
Basalt	0.7	Gypsum	0.8-0.95
Carbon (Unoxidized)	0.8-0.9	Ice	0.98
Graphite	0.7-0.8	Limestone	0.98
Carborundum	0.9	Paper (any colour)	0.95
Ceramic	0.95	Plastic (Opaque)	0.95
Clay	0.95	Soil	0.9-0.98
Concrete	0.95	Water	0.93
Cloth	0.95	Wood (natural)	0.9-0.95

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F. Switching between °C and °F

To switch, press the [€] button until SET is displayed. Press ▲ and ▼ to switch between °C and °F. (Display sample below)



G. Setting Max / Min

Select Max mode by press the wood button until MAX is display.

Press Trigger to measure.

The Thermometer will automatically display

the maximum value at the Secondary Display.

(Display sample is showing at right)

Select Min mode by press the work button until MIN is display.

Press Trigger to measure.

The Thermometer will automatically display

the minimum value at the Secondary Display.

H. Data Logging

This feature is to store the data measured. To store data, at either RT, MAX or MIN mode, press either \blacktriangle or \blacktriangledown .

The Thermometer will show data no. Pull the Trigger together with button to store the measurement.



To retrieve, at RT, MAX or MIN mode, press either \blacktriangle or \blacksquare to view the stored value

Note: Data stored can only override previous stored results.

It is not possible to delete the stored data.

Specifications

Temperature	Operating: 0°C to 50°C (32°F to 120°F) Storage: -20°C to 65°C (-4°F to 150°F)
Relative Humidity	0% to 90% RH at 30°C (86°F)
Battery	9V (6F22)
Size	170 x 103 x 42.5mm
Weight	196g
Temperature Range	-50°C ~ +850°C (-58°F ~ 1022°F)
Accuracy	+/- 1.5% or 1.5°C (3°F) Whichever is greater (Working environment 23°C (73°F) ~ 25°C (77°F).
Repeatability	Within +/-0.5°C (1°F)
Display Resolution	0.1°C / °F
Distance Spot	12:1
Response Time	500mS
Spectral Response Time	8 ~ 14uM
Display / Measurement Hold	7 Seconds
Emissivity	0.10 ~1.00
Laser Sighting	Single
	Output <1mV Class II – Wavelength 630 ~ 670nm

Maintenance

Changing Battery

The figure shows how to open the battery door. Battery: 9V (NEDA 1604, 6F22 or 006P)

Cleaning



A Caution

To avoid damaging the thermometers, do NOT submerge them in water. Do not use abrasive cleaners, they will damage the case.

The Lens

Blow off loose particles using clean compressed air. Carefully wipe the surface with a water-moistened cotton swab.

The Housing

Use soap and water on a damp sponge or soft cloth.

Troubleshooting

Sympton	Cause	Action
(on display)	Measuring is not completed	To measure again by pressing the Trigger again

_OL OL	Target temperature is out of range	Select target within specifications
Û	Low battery	Replace Battery
Blank Display	Thermometer is asleep	Press Trigger
	Possible dead battery	Replace Battery
Laser does not	Low or dead battery	Replace Battery
work	Ambient temperature is above 40°C (104°F)	Use in area with lower ambient temperature.
ERR	Mis-operate	Release the trigger and measure it again

Warranty

NEW INSTRUMENTS HAVE A WARRANTY PERIOD OF: 1 YEAR FROM THE DATE OF PURCHASE BY THE USER, however the warranty period can be extended by a further year by having the instrument calibrated by: Test Instrument Solutions / Calibrations. (A copy of the original purchase invoice may be requested to validate the purchase date).

This warranty period includes parts and labor only. Any unauthorized repair / adjustment will void the warranty. For service / calibration / repair requirements, please contact:

TEST INSTRUMENT SOLUTIONS LIMITED UNIT 12/14, LUDDITE WAY BUSINESS PARK RAWFOLDS WAY CLECKHEATON BD19 5DQ Tel: 01274 752407 Email: <u>SALES@TIS-TIC.CO.UK</u>

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