INSTRUCTIONS IR88

INFRARED GUN THERMOMETER

MARTINDALE
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INTRODUCTION

This instrument is a portable easy to use 3½ digit, compact-sized digital infrared thermometer with laser sighting designed for simple one hand operation. The meter comes with a backlit LCD display, Auto-Hold function and auto power down (10 seconds approx.) after releasing Trigger to extend battery life.

Safety Information

It is recommended that you read the safety and operation instructions before using the infrared thermometer.

DANGER

Pressing the Trigger turns the laser beam on and off. Exercise extreme care and do not allow the laser beam to enter your eye or those of any other person or animal.

- Do not look directly into the laser light.

- When measuring the temperature of an object which has a mirror finish, be careful not to allow the laser light beam to be reflected off the surface into your eyes or those of another person.

- Do not allow the laser light beam to impinge upon any gas which can explode.

- Replace cap after use.

EMC/RFI Readings may be affected if the unit is operated within a radio frequency electromagnetic field strength of approximately 9 volts per meter. The performance of the instrument will not be permanently affected.

CAUTION

- Do not use the unit near any device which generates strong electromagnetic radiation or near a static electrical charge, as these may cause errors.
- Do not use the unit where it may be exposed to corrosive or explosive gases. The unit may be damaged, or explosion may occur.
- Do not keep or use this unit in an environment where in will be directly illuminated by sunshine, or where in will be exposed to high temperatures, high humidity or condensation, as its insulation may be damaged, or it may no longer function according to specification.
- Do not point the lens at the sun or at any other source of strong light, as, the sensor may be damaged.
- Be sure to avoid contact between the lens of the thermometer and the object being tested. Do not allow the lens to become dirty or scratched. Doing so will cause errors.
- Do not touch or hold by the front case. Temperature reading can be affected by heat from hands.
- Do not place the meter on or around hot objects(70°C/158°F). It may cause damage to the case.
- If the meter is exposed to significant changes in ambient temperature (hot to cold or cold to hot), allow 20 minutes for temperature stabilisation, before taking measurements.
- Condensation may form on the lens when going from a cold to hot environment. Wait 10 minutes for condensation to dissipate before taking measurements.
- This unit is not constructed to be water proof or dust proof. Do not use in a very dusty environment or in one where it will get wet.

SPECIFICATIONS

General

Display: 3½ digit liquid crystal display (LCD) with maximum reading of 1999

Low battery indication: the " [+-] " is displayed when the battery voltage drops below the operating level

Measurement time: 0.25 second, nominal

Operating Environment: 32°F to 122°F (0°C to 50°C) at < 70% R.H.

Storage Temperature:-4°F to 140°F (-20°C to 60°C), 0 to 80% R.H. with battery removed

Auto power off: 10 seconds

Standby current consumption: <5µA

Battery: Standard 9V battery (NEDA 1604, IEC 6F22006P)

Battery Life: 9 hours (continuous) typical (using Laser and Back light)

Dimensions: 148mm(H) x 105mm(W) x 42mm(D).

Weight: approx. 157g (including battery.)

Laser Specifications

Laser safety classification of Class 2

Wave Length: Red (630~670nm).

Power out: <1mW, class 2 laser product

Electrical

Temperature Range: -30°C to 550°C / -22°F to 1022°F

Display Resolution: 0.5/1°C (Auto), 1°F

Accuracy : ±(2°C/4°F) for -30°C to 100°C, -22°F to 212°F
                  ± (2% reading) for 101°C to 550°C, 213°F to 1022°F

Temperature Coefficient: ±0.2% of reading or ±0.36°F/0.2°C, whichever is greater, change in accuracy per °F/°C change in ambient operating temperature above 82.4°F/28°C or below 64.4°F/18°C.

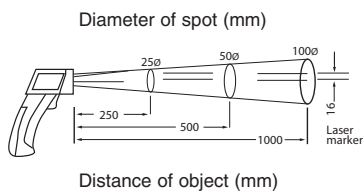**Response Time:** 0.25 second

Spectral Response: 6 to 14µm nominal

Adjustable emissivity (Ɛ): 0.1 to 1.0

Detection Element: Thermopile

Optical Lens: Fresnel Lens

Sighting: 1-beam laser marker <1mW (class 2)

Field of View: 100mmØ at 1000mm (3.9"Ø at 39.0")

Diameter of spot (mm)

Distance of object (mm)

Spot size increases with distance from the probe tip as shown
(Spot Diameter measured at 90 % Energy)

OPERATING INSTRUCTIONS

Trigger:

Pull the trigger on the instrument to measure temperature. Releasing the trigger will cause the instrument to stop measuring and the display will automatically hold the measured reading. After 10 seconds the instrument automatically powers down.

Button function:

1 Set button

SET MODE & Numeric input key

"SET" indicator appears when a numerical value can be set (during setting of Ɛ, ALM Hi and ALM Lo).

▲ key: The numerical value is increased.
▼ key: The numerical value is reduced.
If either of these numerical value keys is held down, the numerical value changes rapidly in the appropriate direction.

The data will be stored in the internal memory of the instrument.

Press SET button switches the mode around the cycle
Ɛ → ALM Hi → ALM Lo → MAX → MIN → HOLD.

HOLD: Releasing the trigger stops measurement of temperature, the HOLD indication appears, and the measured temperature is held.

Ɛ: The thermal emissivity of the object is set using the ▲ and ▼ keys.

ALM Hi: The upper limit alarm temperature is set using the ▲ and ▼ keys. When the measured temperature exceeds the Hi set point, the beeper emits a pulsed tone and"ALM Hi" is displayed.

ALM Lo: The lower limit alarm temperature is set using the ▲ and ▼ keys. When the measured temperature falls below the Lo set point, the beeper emits a continuous tone and "ALM Lo"is displayed.

MAX: The maximum temperature obtained during measurement is displayed.

MIN: The minimum temperature obtained during measurement is displayed.

2 " " button
Press the " " button to activate the laser. " " will be displayed. Press the trigger to carry out measurements. The laser will be visible and the " " will blink on the display. Release the trigger to stop measurements. DO NOT AIM LASER AT EYES.

3 " ☼ " button
Use " ☼" button to turn the Back-Light function on and off.

4 °C/°F button
Readings are displayed in either Celsius (°C) or Fahrenheit (°F). To change between Celsius and Fahrenheit press the °C/°F button .

5 APO button
After 10 seconds of inactivity, the instrument automatically powers down. Press " APO " to deactivate the Auto power off function.

OPERATION

1 Remove the protective cap and pull the trigger to turn on the meter.

2 Point the lens at the object where temperature is to be measured.

3 Pull the trigger. Measurement is performed as long as the trigger is kept depressed.

4 Referring to the spot size figure, aim the laser beam at the object where temperature is to be measured.

5 When the instrument is not in use, be sure to replace the protective cap. NOTE: Although the field of measurement (or Field of View) and the spot almost coincide, the actual field of measurement corresponds to the diameter for 90% optical response. The measured object needs to be larger than the diameter (size of spot) by an adequate margin at least 1.5 to 2 times bigger.

MEASUREMENT CONSIDERATIONS

1 **Theory of Measurement.** Every object emits infrared energy in accordance with its temperature. By measuring the amount of this radiant energy, it is possible to determine the temperature of the emitting object.

2 **About Infrared.** Infrared radiation is a form of light (electromagnetic radiation), and has the property that it passes easily through air while it is easily absorbed by solid matter. With an emission thermometer which operates by detecting infrared radiation, accurate measurement is possible, irrespective of the air temperature or the measurement distance.

3 **Construction.** Structure Infrared radiation which has been emitted from the

object is focused upon an infrared radiation sensor, via an optical system. This includes a lens which is transparent to infrared radiation. The output signal from the infrared radiation sensor is input to an electronic circuit along with the output signal from a standard temperature sensor (Thermopile).

4. **Emissivity.** All objects emit invisible infrared energy. The amount of energy emitted is proportional to the object's temperature and its ability to emit IR energy. This ability, called emissivity, is based upon the material that the object is made of and its surface finish. Emissivity values range from 0.10 for a very reflective object to 1.00 for a black body. Factory set emissivity value is 0.95, which covers 90% of typical applications.

5. If the surface to the measured is covered by frost or other material, clean it to expose the surface.

6. If the surface to be measured is highly reflective, apply masking tape or matt finish black paint to the surface.

7. If the meter seems to be giving incorrect readings check the front cone. There may be condensation or debris obstructing the sensor; clean per instructions in the maintenance section.
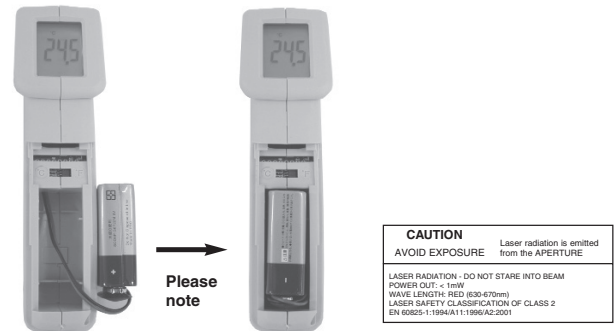
MAINTENANCE

Battery Replacement

1 Power is supplied by a 9 volt "transistor" battery. (NEDA 1604, IEC 6F22).

2 Pull off battery cover "▽".

3 Remove the battery cover by gently sliding it towards the bottom of the meter.

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4 Remove and disconnect the old battery from the meter and replace with a new unit. Wind up the excess lead length and put the top of battery beneath the battery chamber. Install the battery and put back the battery cover.

Cleaning

Periodically wipe the case with a damp cloth, do not use abrasives or solvents.

Please note

CAUTION	
AVOID EXPOSURE	Laser radiation is emitted from the APERTURE

LASER RADIATION - DO NOT STARE INTO BEAM
POWER OUT: < 1mW
WAVE LENGTH: RED (630-670nm)
LASER SAFETY CLASSIFICATION OF CLASS 2
EN 60825-1:1994/A11:1996/A2:2001

Substance	Thermal emissivity	Substance	Thermal emissivity
Asphalt	0.90 to 0.98	Cloth (black)	0.98
Concrete	0.94	Human skin	0.98
Cement	0.96	Leather	0.75 to 0.80
Sand	0.90	Charcoal (powder)	0.96
Earth	0.92 to 0.96	Lacquer	0.80 to 0.95
Water	0.92 to 0.96	Lacquer (matt)	0.97
Ice	0.96 to 0.98	Rubber (black)	0.94
Snow	0.83	Plastic	0.85 to 0.95
Glass	0.90 to 0.95	Timber	0.90
Ceramic	0.90 to 0.94	Paper	0.70 to 0.94
Marble	0.94	Chromium oxides	0.81
Plaster	0.80 to 0.90	Copper oxides	0.78
Mortar	0.89 to 0.91	Iron oxides	0.78 to 0.82
Brick (red)	0.93 to 0.96	Textiles	0.90

Martindale Electric will carry out routine calibration (on a chargeable basis) if the instrument is returned, carriage paid, to the address on the final page of this document. Alternatively, a chargeable collection and return service is available.

Repair & Service
There are no user serviceable parts in this unit. Return to Martindale Electric Company Ltd if faulty. Our service department will promptly quote to repair any faults that occur outside the warranty period.

Storage Conditions
The unit should be kept in warm, dry conditions away from direct sources of heat or sunlight, with the battery removed and in such a manner as to preserve the working life of the unit. It is strongly advised that the unit is not kept in a tool box where other tools may damage it.

Warranty
Faults in manufacture and materials are fully guaranteed for 2 years from date of invoice and will be rectified by us free of charge, provided the unit has not been tampered with and is returned to us with its housing unopened. Damage due to dropping, abuse or misuse is not covered by the guarantee. Nothing in these instructions reduces your statutory rights.

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