Temperature Probe

CMSS 2000-SL

Laser Sighted Non-Contact Temperature Probe

Introduction

We are confident you will find many uses for your hand-held noncontact thermometer Compact, rugged, and easy to use – just aim, pull the trigger, and read the temperature in less than a second. You can safely measure surface temperatures of hot, hazardous, moving, or hard-to-reach objects without contact.

Features

- ***Single Point Laser Sighting***
- ***Adjustable Emissivity***
- ***High and Low Alarm***
- ***MAX, MIN, DIF, AVG Temperature Displays***
- ***Data Logging***
- ***Trigger Lock***
- ***Backlit Display***
- ***Hard Case and Wrist Strap***

The non-contact thermometer senses the energy of an object with an infrared detector. When pointed at an object, the infrared detector collects energy producing a signal that the microprocessor translates as a reading on the backlit display. As the trigger is squeezed, the object temperature is continuously measured by the infrared detector. This allows for fast and accurate real-time readings.

Simply point, shoot and read. No contact with hot surfaces or moving parts means safer, faster, and easier temperature measurements.

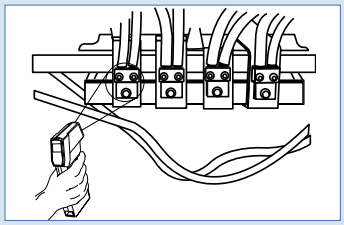
This instrument features a -25°F to +1100°F (-32°C to +600°C) temperature range; laser sighting; LCD backlight; MAX, MIN, ΔT, and AVG temperatures; recall last reading, HI and LOW audible and visual alarms; °C or °F selectable; low battery indicator; recall last reading; and adjustable emissivity for more accurate temperature measurements.

Units are molded from high-strength, solvent-resistant plastic. The optics are recessed for added environmental protection. A cable/strap anchor is provided for the belt clip.

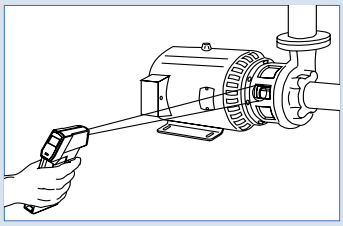
Hard Case

A water resistant, dust-proof case which holds the unit (includes belt clip) and measures 245mm x 169mm x 52mm (9.6” x 6.6” x 2.0”) is included.

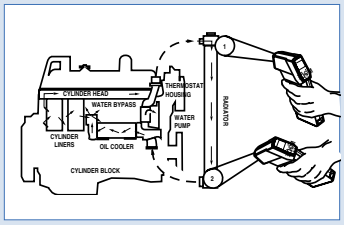
Applications



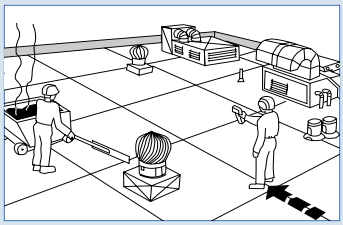
Find hot spots in electrical connections.



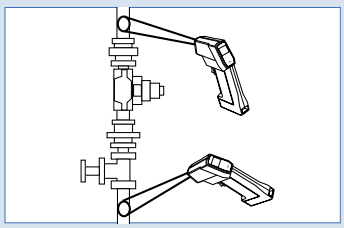
Find hot spots in motors and bearings.



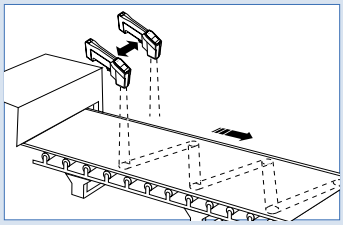
Examine temperature differences in engine blocks to eliminate costly breakdowns.



Verify the temperature of asphalt, welded membranes and rooftop HVAC components.



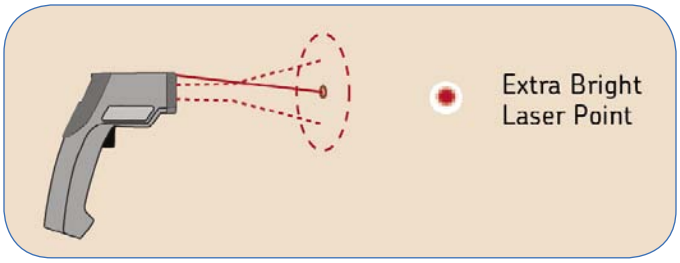
Measure a steamtrap line for temperature differences. Make sure that the diameter of the pipe fills the field-of-view.



Scan a moving surface to examine a dynamic thermal profile.

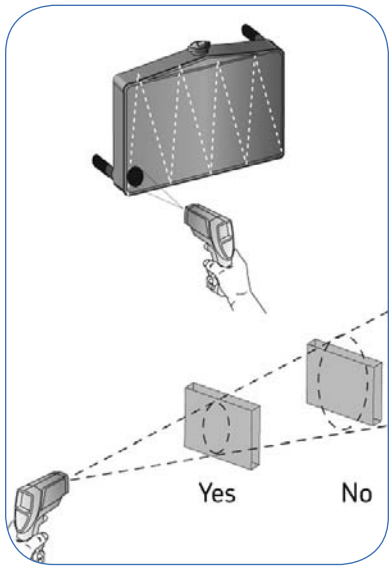
Laser Sighting

With offset single point laser sighting, the laser point shows the approximate center of the area measured.



How to Accurately Measure Temperature

Locating a Hot or Cold Spot



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

Field of View

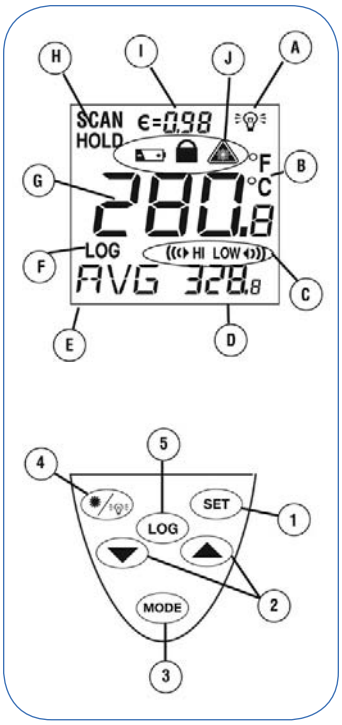
Make sure that the target is larger than the unit's spot size. The smaller the target, the closer you should be to it. (See the diagram on the side of the unit.)

Emissivity

Emissivity is a term used to describe the energy-emitting characteristics of materials. Most organic materials and painted or oxidized surfaces have an emissivity of 0.95. Inaccurate readings can result from measuring shiny or polished metal surfaces. To compensate for this, adjust the unit's emissivity reading, or cover the surface to be measured with masking tape or flat black paint (< 148°C/300°F). Allow time for the tape or paint to reach the same temperature as the material underneath it. Measure the temperature of the tape or painted surface.

Display

User Interface Display



A Backlight "On" symbol

B °F / °C symbol

C High Alarm and Low Alarm symbol

D Temperature values for the MAX, MIN, DIF, AVG, HAL (high alarm), LAL (low alarm), and logged temperatures

E Symbols for MAX, MIN, DIF, AVG, HAL, LAL, PRB

F LOG icon shows log Mode for data storage

G Current temperature value

H SCAN or HOLD

I Emissivity symbol and value

J Low Battery, Lock, and Laser "On" symbols

Buttons

1 SET button (for setting high and low alarm)

2 Up and Down buttons

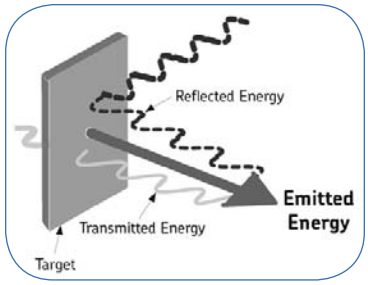
3 MODE button (for cycling through the Mode loop)

4 Laser/Backlight on/off button (pull trigger and press button to activate laser/backlight)

5 LOG button (for storing data)

In **SCAN** mode, the **LCD** displays both the current temperature **(G)** and selected Mode function **(D, E)** in °C/°F **(B)**. The unit will **HOLD** the last reading for 7 seconds after the trigger is released; the word **HOLD** appears **(H)**. When the battery is low, the battery icon is displayed, but the unit will continue to function; when the battery is dead, the display will be blank, and the unit will no longer function. To activate the laser and backlight, pull the trigger. Press the laser/backlight button **(4)** once to activate the backlight, twice to turn both laser and backlight on, and a third time to turn them off.

How It Works



Infrared thermometers measure the surface temperature of an opaque object. The unit's optics sense emitted, reflected, and transmitted energy, which is collected and focused onto a detector. The unit's electronics translate the information into a temperature reading which is displayed on the unit. The laser is used for aiming purposes only.

Measuring Temperature

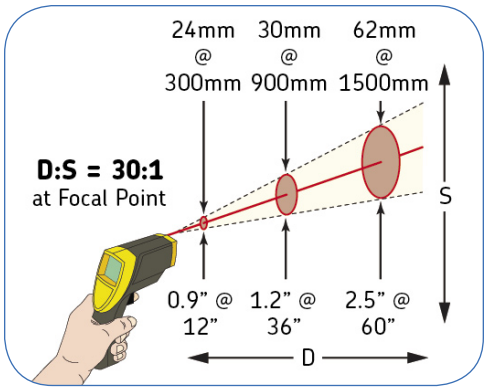
Units measure the surface temperature of objects. To measure temperature, pull and hold the trigger while pointing at the target to be measured (See Distance and Spot Size). A temperature reading appears on the display. If the thermometer is subject to large changes in ambient temperatures (hot to cold or cold to hot), allow 30 minutes for temperature stabilization before taking measurements to ensure accuracy.

Storing Data

The thermometer is capable of storing up to 12 data locations. The infrared temperature, temperature unit (°C or °F) and emissivity are also stored.

Distance and Spot Size

To achieve an accurate temperature reading, unit must be the correct distance from the targeted object. A singular laser spot highlights the approximate center of the spot measurement area. This spot measurement area gets larger the farther away you are from the target. The ratio of the Distance-to-Spot Size, or D:S, is shown in the diagram to the right.



NOTE: *The unit measures the average surface temperature inside the measurement spot.*

Temperature Probe

CMSS 2000-SL

Specifications

Temperature Range: -32°C to +600°C (-25°F to +1100°F)

Accuracy *[assumes ambient operating temperature of +23°C (+73°F) at calibration geometry]:*

For targets above +23°C (+73°F): ± 1% of reading or ± 1°C (± 2°F), whichever is greater.

-18°C to +23°C (0 to +73°F): ± 2°C (± 3°F)

-26°C to -18°C (-15°F to 0°F): ± 2.5°C (± 4°F)

-32°C to -26°C (-25°F to - 15°F): ± 3°C (± 5°F)

Repeatability: ± 0.5% or ≤ ± 1°C (± 2°F), whichever is greater

Response Time: ≤ 0.5 second (95% of reading)

Spectral Response: 8 to 14 µm

Emissivity: Digitally adjustable emissivity (from 0.1 to 1.0 by 0.01)

Ambient Operating Range: 0 to +50°C (+32°F to +120°F)

Relative Humidity: 10% to 90% relative humidity noncondensing, at < +30°C (+86°F) ambient

Storage Temperature: -20°C to +60°C (-13°F to +158°F) without battery

Weight: 320g (11 oz)

Dimensions: 200mm x 160mm x 55mm (8" x 6" x 2")

Power: 9V Alkaline or NiCad battery

Typical Battery Life (Alkaline):

- 20 hours (with laser and backlight on 50%)
- 40 hours (with laser and backlight off)

Laser Sighting (Class II): Extra Bright Laser Point

Typical Distance to Target: 5 Meters (15 Feet)

Distance to Spot (D:S): 30:1 at focus point

MIN, MAX, AVG, DIF, Temperature Display

Data Logging: 12 points

Probe Jack

Display Hold: 7 seconds

Hi / Low Alarm

LCD Backlit

Temperature Display: °C or °F selectable

Display Resolution: 0.1°C (0.1°F)

Hard Carrying Case

Locking Trigger

Tripod Mounting: 6.35mm (1/4-20 UNC threading)

Ordering Information

CMSS 2000-SL Temperature Probe, including Multilingual User Manual (English, French, German, Portuguese, and Spanish).

Optional Kits that Includes the CMSS 2000-SL Temperature Probe

CMPK 60 plus Bearing Analysis Kit (English) includes:

- CMSS 2000-SL Temperature Probe
- TMEH1 OilCheck Monitor
- CMVP 40 Vibration Pen plus

CMPK 70 plus Bearing Analysis Kit (Metric) includes:

- CMSS 2000-SL Temperature Probe
- TMEH1 OilCheck Monitor
- CMVP 50 Vibration Pen plus

CE

SKF Reliability Systems
5271 Viewridge Court • San Diego, California 92123 USA
Telephone: +1 858-496-3400 • FAX: +1 858-496-3531

Web Site: www.skf.com/reliability

SKF