Raynger® ST™

ST20 Pro™ Standard
ST30 Pro™ Enhanced

Noncontact Thermometer • Fernmessthermometer
• Thermomètre sans Contact • Termómetro sin Contacto
• Termômetro sem Contato
• **非接触温度計** • 非接触测温仪

Table of Contents

57500-1 Rev. E 9/01

Specifications

Temperature range	
ST20 Pro™	-32 to 400°C (-25 to 750°F)
ST30 Pro™	-32 to 545°C (-25 to 950°F)
D : S	12 : 1 (ST30 has 90% encircled energy at the focal point)
Display resolution	0.2°C (0.5°F)
Accuracy (assumes ambient operating temperature of 23–25°C/73–77°F) @ calibration geometry*	For targets: Above 23°C (73°F): ±1% of reading or ±1°C (±2°F), whichever is greater -18 to 23°C (0 to 73°F): ±2°C (±3°F) -26 to -18°C (-15 to 0°F): ±2.5°C (±4°F) -32 to -26°C (-25 to -15°F): ±3°C (±5°F)
Repeatability	±1°C (±2°F), or ±0.5% of reading, whichever is greater
Response time	500 mSec
Spectral response	8–14 µm
Emissivity	pre-set 0.95
Ambient operating range	0 to 50°C (32 to 120°F)
Laser max	Laser turns off above 40°C (104°F) ambient temperature
Relative humidity	10–90% RH noncondensing, at < 30°C (86°F) ambient
Storage temperature	-20 to 60°C (-13 to 158°F) without battery
Weight/Dimensions	320g (11oz); 200 x 160 x 55 mm (8 x 6 x 2 in)
Power	9V Alkaline or NiCd battery
Typical battery life (Alkaline)	10 hours with laser and backlight on 40 hours with laser and backlight off
Tripod mount	1/4in 20 UNC threading

*Unit calibrator is 279.4mm (11 in) from the 140mm (5.5 in) 0.95 emissivity backbody.

- Display
- Anzeige
- Affichage
- Pantalla
- Display
- 显示面板
- ディスプレイ

- Laser
- Laser
- Laser
- Láser
- Laser
- 激光
- レーザー

- Trigger
- Messtaste
- Gâchette
- Gatillo
- Gatilho
- 扳机
- トリガ

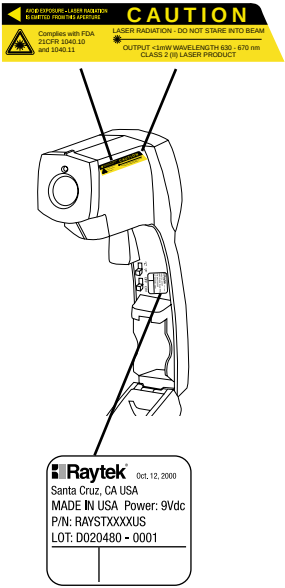
- °C/°F Switch
- °C/°F-Schalter
- Commutateur °C/°F
- Interruptor de °C/°F
- Chave °C/°F
- ℃ / ℉开关
- ℃/℉スイッチ

- Product Identification Label
- Seriennummernlabel
- Etiquette d'Identification de Produit
- Etiqueta de Identifación del Producto
- Etiqueta de Identificação do Produto
- 证书
- 製品IDラベル

- Backlight On/Off Switch
- Schalter für Displaybeleuchtung
- Commutateur Rétroéclairage
- Interruptor de Encendido de Luz de Fondo.
- Interruptor da Retroiluminação
- 背景光开关
- バックライト

- Battery Compartment
- Batteriefach
- Logement des piles
- Compartimento de las pilas
- Compartimento de bateria
- 电池室
- 電池収納部

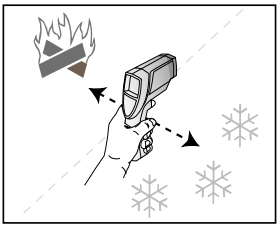
- Battery Cover
- Batterieabdeckung
- Couvercle du Compartiment Pile
- Tapa de las pilas
- Tampa da bateria
- 电池盖
- 電池カバー



Warning

Do not point laser directly at eye or indirectly off reflective surfaces.

Product Identification Label



Cautions

All models should be protected from the following:

- ▲ EMF (electro-magnetic fields) from arc welders, induction heaters, ect...
- ▲ Static electricity
- ▲ Thermal shock (caused by large or abrupt ambient temperature changes—allow 30 minutes for unit to stabilize before use)
- ▲ Do not leave the unit on or near objects of high temperature

Features

Your thermometer includes:

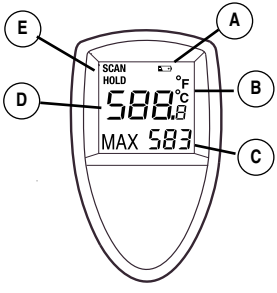
- Single-point laser sighting (Standard Model)
- Circular laser sighting (Enhanced Model)
- MAX temperature display
- Backlit graphic display
- Tripod mount
- Durable, ergonomic construction

Options/Accessories

- Nylon Holster
- N.I.S.T./DKD Certification

Display

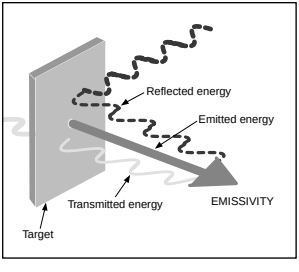
A) Low battery indicator (comes on when battery is low)
B) °C/°F symbol
C) Maximum temperature value (continuously updated while the unit is on)
D) Temperature display
E) Scan/Hold indicator



In the scan mode, the backlit LCD displays both the current temperature (D) and maximum temperature (C) in Celsius or Fahrenheit (B). The unit will hold the last reading for 7 seconds after the trigger is released; the word HOLD appears (E). The presence of the battery icon (A) indicates a low battery.

Introduction

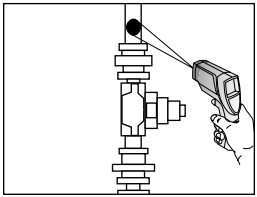
We are confident you will find many uses for your handheld noncontact thermometer. Compact, rugged, and easy to use—just aim, pull the trigger, and read the temperature in less than a second. You can safely measure surface temperatures of hot, hazardous, or hard-to-reach objects without contact.



How it Works

Infrared thermometers measure the surface temperature of an object. The unit's optics sense emitted, reflected, and transmitted energy, which are 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.

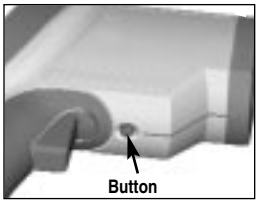
How to Operate the Unit



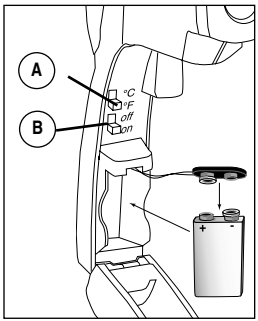
Measurement: Quick Start

To measure a temperature, point the unit at an object, and pull the trigger. Be sure to consider distance-to-spot size ratio and field of view. When using the laser, use it only for aiming. For more detailed operating instructions, see "How to Accurately Measure Temperature."

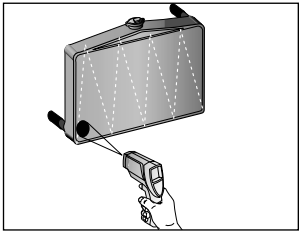
Switching °C and °F; Changing the Battery; Laser and Backlight On/Off



To open the unit's handle, push the button near the trigger on the underside of the unit, and pull the handle down and forward. To select °C or °F, slide the top switch (A) up for Celsius and down for Fahrenheit. To activate the laser and backlight, slide the lower switch (B) down. The laser and backlight will turn on when the trigger is pulled. The laser will turn off when the trigger is released. The backlight will remain on for 7 seconds after the trigger is released.



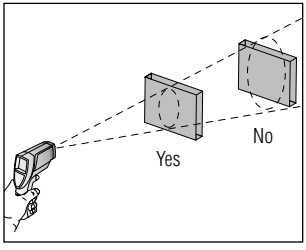
To change the 9V battery, attach the battery to the battery snaps with the positive side toward the rear of the battery compartment.



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 scan across the area with an up and down motion until you locate the hot or cold spot.



Field of View

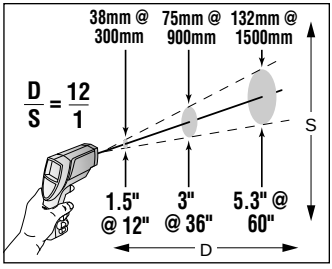
Make sure that the target is larger than the unit's spot size. The smaller the target, the closer you should be to it. When accuracy is critical, make sure the target is at least twice as large as the spot size.

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 (pre-set in the unit). Inaccurate readings can result from measuring shiny or polished metal surfaces. To compensate, cover the surface to be measured with masking tape or flat black paint. Allow time for the tape or paint to reach the same temperature as the the material underneath it. Measure the temperature of the tape or painted surface.

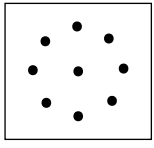
Distance & Spot Size

As the distance (D) from the object increases, the spot size (S) of the area measured by the unit becomes larger. The relationship between distance and spot size is 12:1 at the focus point (0.914 meter/36 inches). The spot sizes indicate 90% encircled energy.



Laser Sighting

The circular laser is made up of eight laser spots that form a circle to show the approximate area being measured; a single laser spot shows the center of the measurement area. In low-light conditions, lighter spots surrounding the laser circle may appear. These spots are not used for aiming purposes. Use only the laser circle to aim the unit.



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

Reminders

- When measuring at short distances (.5 meters or 1.5 feet), be sure to point the thermometer using the sighting guides on the top of the unit, to compensate for the offest of the laser circle.
- Not recommended for use when measuring shiny or polished metal surfaces (stainless steel, aluminum, etc.). See “Emissivity” for measuring these surfaces.
- The unit cannot measure through transparent surfaces such as glass or plastic. It will measure the surface temperature of these materials instead.
- Steam, dust, smoke, or other particles can prevent accurate measurement by obstructing the unit’s optics.

Maintenance

Lens Cleaning: Blow off loose particles using clean compressed air. Gently brush remaining debris away with a soft brush. Carefully wipe the surface with a moist cotton swab. The swab may be moistened with water.
Note: Do not use solvents to clean the plastic lens.

Cleaning the housing: Use soap and water on a damp sponge or soft cloth.
Note: Do not submerge the unit in water.

Troubleshooting

Code	Problem	Action
– – – (on display)	Target temperature is over or under range	Select target within specifications
Battery icon 	Low battery	Check and/or replace battery
Blank display	Possible dead battery	Check and/or replace battery
Laser doesn't work	(1) Low or dead battery (2) Ambient temperature above 40°C (104°F)	(1) Replace battery (2) Use in area with lower ambient temperature
ERR	Possible damage by EMF	Contact your distributor

CE

CE Certification

This instrument conforms to the following standards:

- EN61326-1 EMC
- EN61010-1
- EN60825-1 Safety

Tests were conducted using a frequency range of 80–1000 MHz with the instrument in three orientations.
Note: Between 165 MHz and 880 MHz (+/- 5%) at 3V/m, the instrument may not meet its stated accuracy.