

# Portable Non-Contact Thermometer Instruction Manual

## THERMO-HUNTER PT-5LD



# OPTEX

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### Introduction

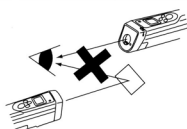
- Please make sure the model you purchased is the one you specified.
- Please read the manual thoroughly before using the THERMO-HUNTER PT-5LD for correct usage.
- After reading this manual, please retain it for future reference.
- OPTEX is not liable for any incidental or consequential damages or losses including losses of data or chances of measurement, arising from accident, misuse or abnormal conditions of operation or handling.

### Safe Usage

This instruction manual contains various warnings for your safety and proper usage to avoid possible personal injury. Please be sure to heed the warnings and strictly follow safety instructions.

**CAUTION :** This symbol signifies that improper usage may result in injuries or damage.

#### CAUTION



Do not look into the laser beam, nor point it directly at eyes. Even the reflection is harmful. This laser may cause eye injury or damage to your health.

#### CAUTION



This product is not a clinical thermometer and therefore, can not be used for medical purposes.

#### CAUTION



Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Thank you very much for purchasing OPTEX products. This device is a non-contact thermometer to convert the infrared energy emitted from the surface of an object into temperature. This thermometer measures the surface temperature of solid and liquid without contacting them. The temperature of gas cannot be measured by this thermometer.

### Maintenance / Battery

#### Maintenance

##### [Filter]

Dust, stain or scratch on a filter causes incorrect measurement. If the filter is stained, clean the filter with a lens-cleaning blower or wash it with clean water. If the filter is still stained, gently wipe the stain off with a cotton swab or lens cleaning cloth, which may be moistened with ethyl alcohol.

**Note.** If any water drop is on the filter and/or the area around it, the thermometer measures temperature of the water drop, which results in incorrect measurement. Wipe up the filter and the area around it completely before taking measurement.

##### [Main Unit]

This thermometer has waterproofing; therefore, it can be washed with clean water. If the thermometer is stained considerably, wash it with a little neutral detergent diluted with clean water. After cleaning the thermometer by washing, wipe it completely before use.

**Note.** Do not use hot water over 50°C or chemicals such as thinner and benzene for cleaning as it may deform or damage the thermometer.

##### [Annual Inspection]

Re-calibration is recommended once a year. Ask the distributor where you purchased the unit for details.

#### Battery

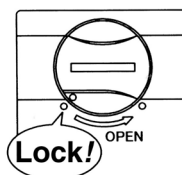
##### [Installing Battery]

When the battery level indicator shows little electricity left and/or "b-" sign on the display blinks, replace the battery with a new one.

**Note.** Upon replacing the battery, keep the battery compartment out of the water. Wipe the main unit completely.

- ① Turn the lock for battery cover at the back of main unit counterclockwise to open the battery compartment.
- ② Match the "+" "-" polarities of the battery with the signs on the battery compartment.
- ③ Close the battery cover and turn the lock clockwise to fix it.

**Note.** If the compartment cover is not locked properly, water penetrates the inside and the waterproofing does not work. Be sure to lock it completely.

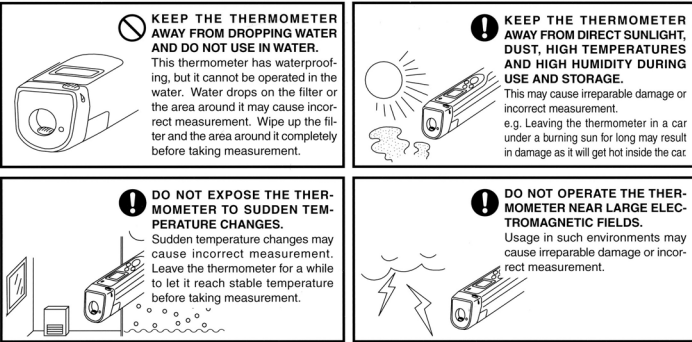


##### Cautions on battery

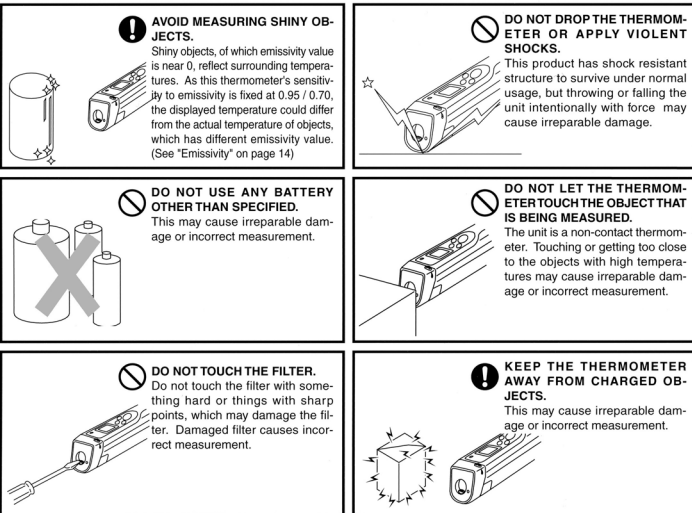
- Do not throw used batteries into a fire nor recharge it
- Do not dispose any used battery together with garbage. Follow local laws or regulations when disposing batteries.
- Remove the battery for a long-time storage.

## Safe Usage — Warnings & Cautions on Environment and Usage

### Environmental Warnings / Cautions ☹ — Warning ! — Caution



### Usage Warnings / Cautions ☹ — Warning ! — Caution



## Specifications

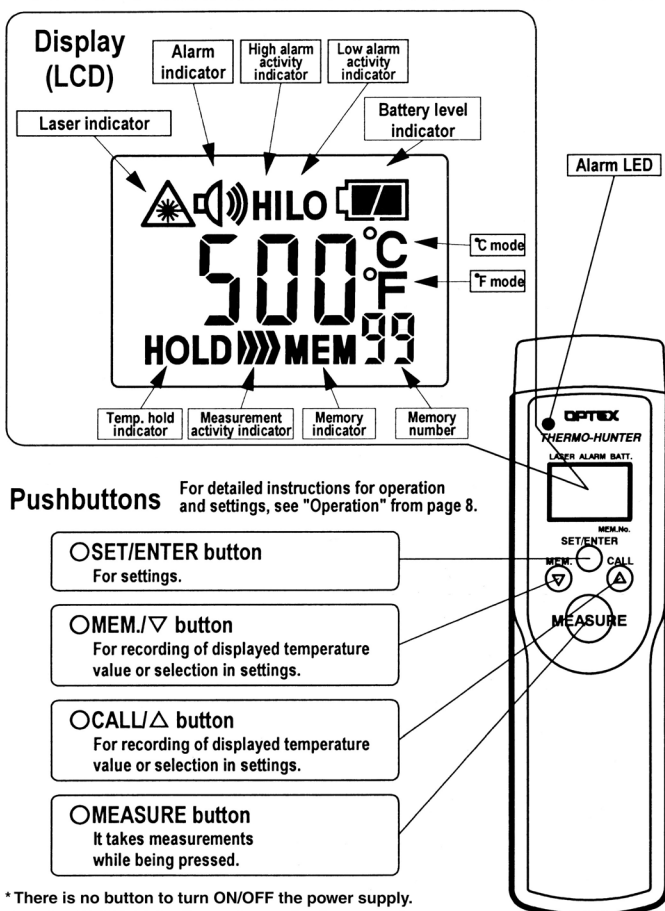
Model	PT-5LD
Measurement range	0 ~ 500 °C
Display range	-10 ~ 650 °C
Field of view	φ25 / 300mm (D : S=15 : 1)
Optics	mirror / silicon filter
Sensing element	Thermopile
Spectral response	8-14 μm
Response time	0.7 sec. / 90%
Accuracy (ε ≈ 0.95)	0 ~ 200 °C : ± 2 °C, 201 °C ~ : ± 1 %
Repeatability	± 1 °C of reading value
Display resolution	1 °C
Sighting method	Non-coaxial laser marker (Class 2)
HOLD time	15 seconds
Continuous measurement mode	ON / OFF Switchable
Memory	99-point memory
High / Low Limit Temp. for Alarm LED / Buzzer	ON / OFF Switchable
Emissivity(ε) Adjustment	DARK(ε = 0.95) / BRIGHT(0.70) Switchable
Temperature unit	°C / F (Switchable)
Power supply	9V layer-built alkaline dry battery (1 piece)
Battery life	12 Hours (With max load)
Ambient temperature	0 to 50 °C
Ambient humidity	35% to 85%Rh (Without due condensation)
Storage temperature	-10 to 60 °C
Protective structure	* IP67
Material	ABS (Antibacterial)
Dimension	H x W x D = 160 x 44 x 42mm
Weight	200g (Incl. Battery)

Accessories : 9V layer-built alkaline dry battery (1 piece), Quick Reference Card, Instruction Manual (this book)  
Option : Black tape

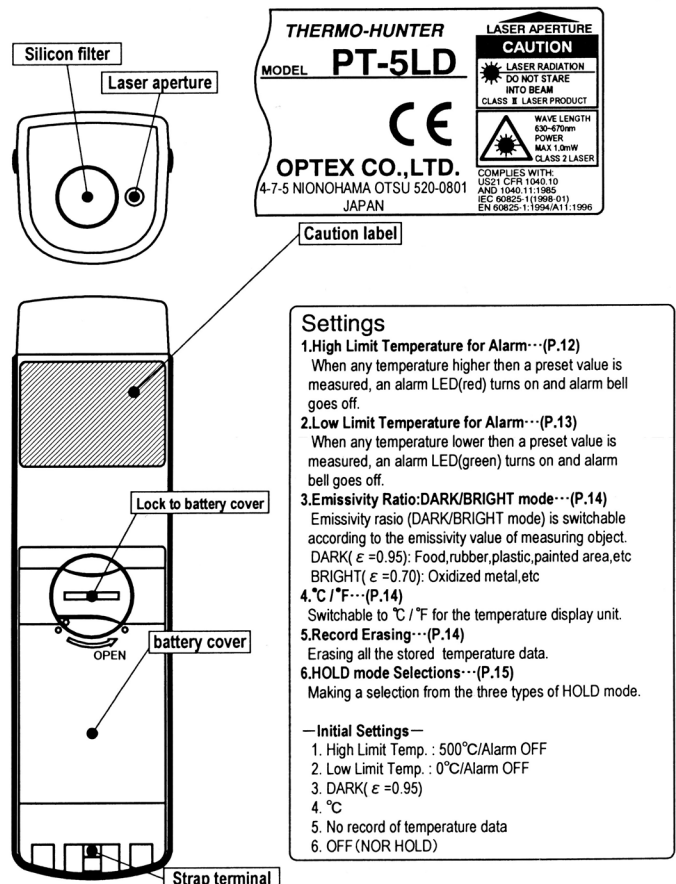
\* IP67 : It indicates a level of the protection structure of the product against water and dust under specified conditions. This protection structure is in accordance with the standards of IEC (International Electrotechnical Commission), JIS (Japanese Industrial Standards) and JEMA (The Japan Electrical Manufacturers' Association).

※ Specifications may change without prior notice.

## Name of Components



\* There is no button to turn ON/OFF the power supply. Pressing MEASURE button wakes up the thermometer. The power supply turns off automatically after 15 seconds' absence of pressing any button.



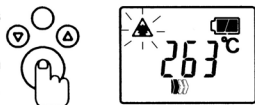
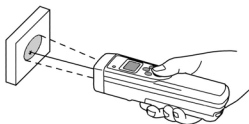
## Operation

Set the battery supplied as an accessory and operate the unit according to the following procedure:

### • Normal Measurement

#### [Starting Normal Measurement]

- 1 Press (MEASURE) button to turn on the power supply. A laser beam is emitted and the measurement starts. (In the Normal Measurement mode, the unit takes measurements while (MEASURE) button is pressed.)
- 2 Point the laser beam at a measuring object and aim it at the center of the area to be measured. For the distance from this thermometer to the measuring object, refer to page 9.
- 3 In the Normal Measurement mode, the measurement indication " " is shown on the LCD display and a laser indicator blinks.

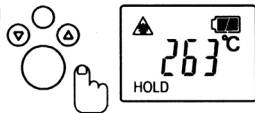


#### [Quitting Normal Measurement / HOLD mode]

- 1 Release (MEASURE) button. Then, the laser beam turns off and a value measured last is displayed for 15 seconds (HOLD mode). The power supply turns off automatically after 15 seconds.

\* NOR HOLD can be changed into MAX/MIN HOLD.

(See "Setting" on page 15)



### • Continuous Measurement

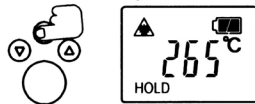
#### [Starting Continuous Measurement]

- 1 Press and hold both of (MEASURE) button and (SET/ENTER) button simultaneously for two seconds or more, then the Continuous Measurement mode switched on. (In the Continuous Measurement mode, the thermometer keeps measuring temperatures without pressing (MEASURE) button.)
- 2 During the Continuous Measurement mode, LCD display shows "ct".



#### [Quitting Continuous Measurement]

- 1 To quit the Continuous Measurement mode, press and hold (SET/ENTER) button for two seconds or more. Then, it switches to HOLD mode. The power supply turns off automatically after 15 seconds in the HOLD mode.

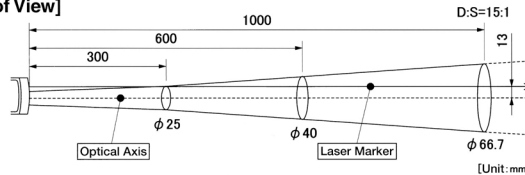


**Attention :** The laser beam is constantly emitted during Continuous Measurement mode. Be careful of it while operating the thermometer.

## Field of View

For the non-contact thermometer (infrared thermometer), the field of view (spot size) is specified depending on the distance from the thermometer to the measuring object as shown below. The temperature value displayed is the average temperature within the spot size. To take an accurate measurement, check the correlation between the size of object and the distance to it.

#### [Field of View]

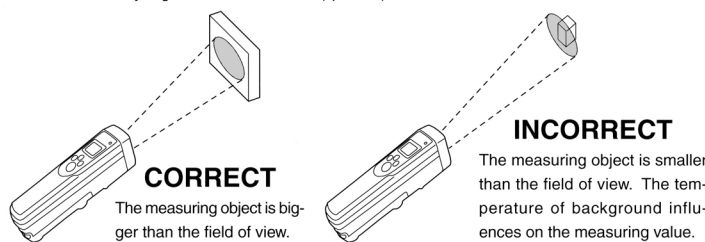


#### \* Remarks

- ex.) The average temperature of surface of the circle 25 mm in diameter is measured at a distance of 300 mm away from the measuring object.
- \* The laser beam points 13mm off to the left from the center of the field of view. The laser marker functions as a sighting method and not a sensing element.
  - \* It is possible to take temperatures with this thermometer at a distance of 1,000 mm or more away from the measuring object, unless there is any obstacle. However, please note that the measuring field of view enlarges in proportion to the measuring distance. This thermometer has an optical resolution of 15:1 [D(Distance to the measuring object):S(Spot size)].

#### [For Correct Measurement]

The optical resolution values stated in "Field of View" are at minimum 90% energy. The size of measuring object should be sufficiently larger than the field of view (spot size) shown in the above illustration.



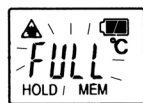
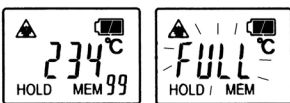
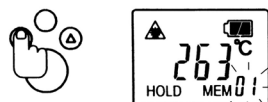
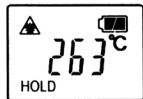
**Note.** If any water drop is on the filter and/or the area around it, the thermometer measures temperature of the water drop, which results in incorrect measurement. Wipe up the filter and the area around it completely before taking measurement. (See "Maintenance" on page 16)

## Memory Function

The non-contact thermometer PT-5LD can store 99-point temperature data in memory. Operate according to the following procedure:

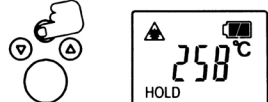
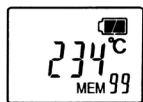
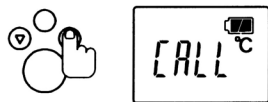
#### [Recording / MEM. mode]

- 1 Press and hold (MEM/V) button for two seconds or more to record the temperature value displayed at the time when you start pressing the button. Memory function is available in Normal Measurement mode, Continuous Measurement mode or HOLD mode (refer to page 8).
- 2 When the temperature data is recorded, "MEM" sign and the memory number (01 to 99) on LCD display blink.
- 3 A maximum of 99 points of temperature data can be recorded in the memory.
- 4 When you try to enter the memory over 100 points, the display shows "FULL".



#### [Recalling / CALL Mode]

- 1 Press and hold (CALL/Δ) button for two seconds or more in HOLD Mode (refer to page 8), and "CALL" sign appears on the LCD display. In CALL (recalling) mode, the last record of temperature data and the corresponding memory number are shown on the display.
- 2 By pressing (MEM/V) or (CALL/Δ) button, you can select the memory number to show the stored temperature value corresponding to the memory number.
- 3 To quit CALL mode, press (SET/ENTER) or (MEASURE) button. You can enter HOLD mode by pressing (SET/ENTER) button, or Normal Measurement mode by pressing (MEASURE) button.



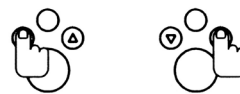
\* To erase all the stored records, see "Record Erasing" on page 14.

## Settings

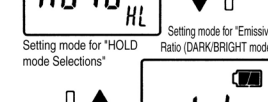
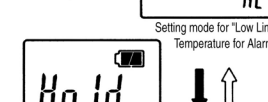
This section gives you an explanation on how to set the following functions: "High Limit Temperature for Alarm", "Low Limit Temperature for Alarm", "Emissivity Ratio (DARK/BRIGHT mode)", "C/F mode" and "Record Erasing" "HOLD mode Selections".

#### [Selecting Functions]

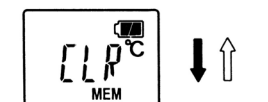
- 1 Press and hold (SET/ENTER) button for one second or more in the HOLD Mode (refer to page 8), and "SET" sign appears on the LCD display. (Function selecting mode follows.)
- 2 By pressing (CALL/Δ) or (MEM/V) button, you can select functions as shown in the right illustrations.



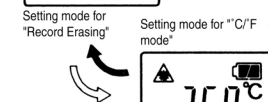
- 3 When the name of the function you desire appears on the display, press (SET/ENTER) button to set. Then, you can enter the detailed setting mode.
  - "High Limit Temperature for Alarm" setting, refer to page 12.
  - "Low Limit Temperature for Alarm" setting, refer to page 13.
  - "Emissivity Ratio (DARK/BRIGHT mode)", "C/F mode" and
  - "Record Erasing" settings, refer to page 14.
  - "HOLD mode Selections" refer to page 15.



- 4 When each setting is completed, it automatically turns to the next setting mode. (For example, when setting of "High Limit Temperature for Alarm" is completed, it comes to the setting mode for "Low Limit Temperature for Alarm".)



- 5 To quit the setting mode, press (MEASURE) button.

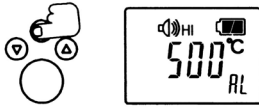


## Setting — "High Limit Temperature for Alarm"

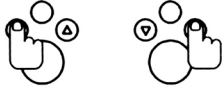
When any temperature higher than a preset value is measured, an alarm LED (red) turns on and an alarm bell (high tone) goes off.

### [Setting "High Limit Temperature for Alarm"]

- Enter the setting mode for "High Limit Temperature for Alarm" according to the procedure described in page 11. The initial setting is at 500 °C.
- Press  $\nabla$  or  $\triangle$  button in the setting mode to change the temperature value, which you need alarm at.

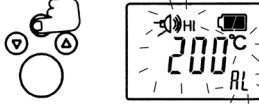


Setting mode for "High Limit Temperature for Alarm" (Initial setting: 500 °C)



Changing the temperature value to 200 °C by using  $\nabla$ / $\triangle$  button.

- Press  $\text{SET/ENTER}$  button to set the displayed value as the High Limit Temperature for Alarm.

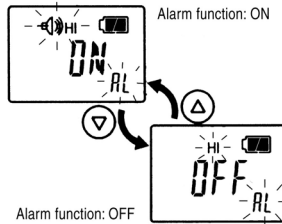


Setting the temperature value with  $\text{SET/ENTER}$  button.

**Attention: The "High Limit Temperature for Alarm" cannot be set at lower temperature than "Low Limit Temperature for Alarm".**

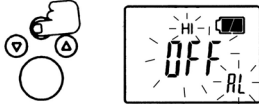
### [Turning ON/OFF Alarm Function]

- When the High Limit Temperature setting is completed, the setting mode for ON/OFF Alarm Function appears. Press  $\nabla$  or  $\triangle$  button to select ON or OFF.



Alarm function: OFF

- Press  $\text{SET/ENTER}$  button to set ON or OFF. While the Alarm function is OFF, the Alarm function does not work even if the measuring temperature goes higher than a preset level.

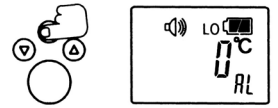


## Setting — "Low Limit Temperature for Alarm"

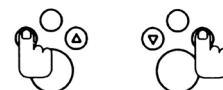
When any temperature lower than a preset value is measured, an alarm LED (green) turns on and an alarm bell (low tone) goes off.

### [Setting "Low Limit Temperature for Alarm"]

- Enter the setting mode for "Low Limit Temperature for Alarm" according to the procedure described in page 11. If you have already set the High Limit Temperature as in page 12, the setting mode for "Low Limit Temperature for Alarm" turns up automatically. The initial setting is at 0 °C.
- Press  $\nabla$  or  $\triangle$  button in the setting mode to change the temperature value, which you need alarm at.

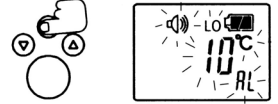


Setting mode for "High Limit Temperature for Alarm" (Initial setting: 0 °C)



Changing the temperature value to 10 °C by using  $\nabla$ / $\triangle$  button.

- Press  $\text{SET/ENTER}$  button to set the displayed value as the Low Limit Temperature for Alarm.

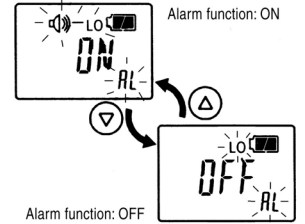


Setting the temperature value with  $\text{SET/ENTER}$  button.

**Attention: The "Low Limit Temperature for Alarm" cannot be set at higher temperature than "High Limit Temperature for Alarm".**

### [Turning ON/OFF Alarm Function]

- When the Low Limit Temperature setting is completed, the setting mode to ON/OFF Alarm Function appears. Press  $\nabla$  or  $\triangle$  button to select ON or OFF.



Alarm function: OFF

- Press  $\text{SET/ENTER}$  button to set ON or OFF. While the Alarm function is OFF, the Alarm function does not work even if the measuring temperature goes higher than a preset level.



## Setting — "Emissivity Ratio (DARK/BRIGHT mode)", "°C / °F mode" and "Record Erasing"

### [Emissivity Ratio (DARK/BRIGHT mode)]

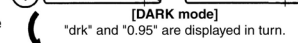
**Emissivity ( $\epsilon$ )**  
Emissivity is a value that indicates the infrared energy emitted from the surface of an object. Every object has its own emissivity value and it varies depending on the surface condition or the temperature of the object. The emissivity ratio of PT5LD is fixed at two points, i.e., DARK ( $\epsilon=0.95$ ) and BRIGHT ( $\epsilon=0.70$ ).  
Example : DARK ( $\epsilon=0.95$ ): Food, rubber, plastic, painted area, etc.  
BRIGHT ( $\epsilon=0.70$ ): Oxidized metal, etc.

If the object has different emissivity value from either of the above ratio, there could be some possibilities that the measured temperature value on the display shows different from the actual temperature value of the object. Refer to the above examples as a guideline for setting DARK/BRIGHT mode. When you wish to measure shiny object like metals, put a piece of optional black tape ( $\epsilon=0.95$ ) on the surface of the measuring object to cover the measuring area, if possible.

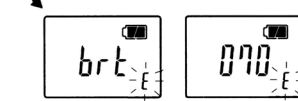
- Enter the setting mode for "Emissivity Ratio (DARK/BRIGHT mode)" according to the procedure described in page 11. The initial setting is DARK ( $\epsilon=0.95$ ).



- Press  $\nabla$  or  $\triangle$  button in the setting mode to change the emissivity ratio (DARK or BRIGHT).



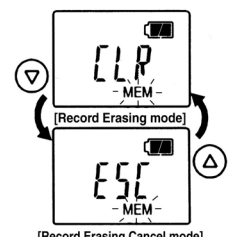
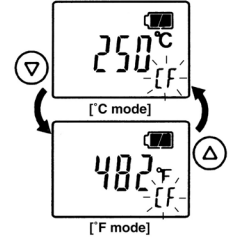
- Press  $\text{SET/ENTER}$  button to set the emissivity ratio.



[BRIGHT mode]  
"brt" and "0.70" are displayed in turn.

### [Setting "°C/°F mode"]

- Enter the setting mode for "°C/°F mode" according to the procedure described in page 11. The initial setting is °C.
  - Press  $\nabla$  or  $\triangle$  button in the setting mode to choose the temperature display unit whether °C or °F mode.
  - Press  $\text{SET/ENTER}$  button to set the temperature display unit.
- \* When it is set for °F mode, the displayed temperature value measured, set or stored in memory is automatically converted to Fahrenheit in any mode.**



[Record Erasing Cancel mode]

### [Record Erasing]

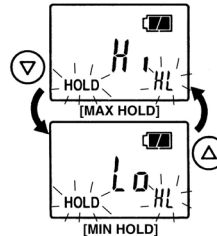
Note this function is to erase all the stored records in memory. It is not able to erase data one by one.

- Enter the setting mode for "Record Erasing" according to the procedure described in page 11.
  - Press  $\nabla$  or  $\triangle$  button in the setting mode to select "CLR" sign on the display.
  - Press  $\text{SET/ENTER}$  button, and all the recorded data are erased.
- \* If you wish to cancel the Record Erasing, press  $\nabla$  button to select "ESC" sign on the display and press  $\text{SET/ENTER}$  button. Then, you can return to the setting mode again.**
- \* Please note that OPTEx is not liable for any loss of data.**

## Setting — "HOLD mode Selections"

### [Setting "HOLD mode Selections"]

- Enter the setting mode for "HOLD mode Selections" according to the procedure described in page 11.
  - Press  $\nabla$  or  $\triangle$  button in the setting mode to select ON or OFF. The initial setting is OFF. (NOR HOLD)
  - Press  $\text{SET/ENTER}$  button to set ON or OFF.
  - In case of ON, "HOLD mode Selections" can be available. Press  $\nabla$  or  $\triangle$  button to select the HOLD mode. (MAX or MIN).
  - Press  $\text{SET/ENTER}$  button to set the HOLD mode.
- NOR HOLD : A value measured last is displayed.  
MAX HOLD ("HI" on display) : The maximum value is displayed during the measurement.  
MIN HOLD ("Lo" on display) : The minimum value is displayed during the measurement.



## Troubleshooting

Condition	Cause	Solution
Nothing on display.	The battery has run out of electricity. Otherwise the battery is not installed correctly in a battery compartment.	Replace the battery with a new one. Otherwise install the battery correctly in the battery compartment.
The laser will not activate.	A laser aperture is stained. Voltage for laser is insufficient.	Clean the laser aperture referring "Main Unit" of "MAINTENANCE" described in page 16. Replace the battery with a new one. (A sign-b-links.) Otherwise install the battery correctly in the battery compartment.
Measured temperature value seems incorrect.	A filter unit is stained. Field of view is deviated from the measuring object. The measuring object is smaller than the field of view.	Clean the filter referring "Filter" of "MAINTENANCE" described in page 16. Center the laser beam on the measuring object by referring "Field of View" described in page 9. Adjust the measuring range referring to "Field of View" shown in page 9.
	Affected by a nearby heating source	Block the heating source with a shielding plate or something like that to avoid interference.
A displayed temperature value is unstable.	Measuring temperature of a shiny metal surface. The thermometer is affected by considerable temperature fluctuation.	The displayed temperature could differ from the actual temperature of which surface is shiny or polished. Put a piece of optional black tape on the measuring object, if possible. Wait until the temperature of thermometer stabilizes.

If the condition is not improved by the above-mentioned solutions, the thermometer may be out of order. Please contact the distributor where you purchased the unit.