Portable Non-Contact Thermometer

Instruction Manual

THERMO-HUNTER PT-5LD

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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.

Contents

Introduction

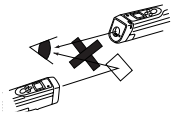
- Please make sure the model you purchased is the one you specified.
- Please read the manual thoroughly before using the THERMO-HUNTER PT-5LD for correct usage.
- After reading this manual, please retain it for future reference.
- OPTEX is not liable for any incidental or consequential damages or losses 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.

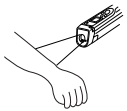
⚠CAUTION : This symbol signifies that improper usage may result in injuries or damage.

⚠ 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

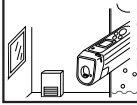
Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Safe Usage — Warnings & Cautions on Environment and Usage

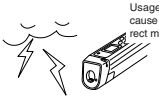
Environmental Warnings / Cautions ⊘ — Warning ❗ — Caution

KEEP THE THERMOMETER AWAY FROM DROPPING WATER AND DO NOT USE IN WATER.
This thermometer has waterproofing, but it cannot be operated in the water. Water drops on the filter or the area around it may cause incorrect measurement. Wipe up the filter and the area around it completely before taking measurement.

KEEP THE THERMOMETER AWAY FROM DIRECT SUNLIGHT, DUST, HIGH TEMPERATURES AND HIGH HUMIDITY DURING USE AND STORAGE.
This may cause irreparable damage or incorrect measurement.
e.g. Leaving the thermometer in a car under a burning sun for long may result in damage as it will get hot inside the car.

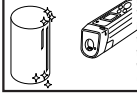


DO NOT EXPOSE THE THERMOMETER TO SUDDEN TEMPERATURE CHANGES.
Sudden temperature changes may cause incorrect measurement. Leave the thermometer for a while to let it reach stable temperature before taking measurement.

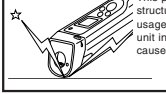


DO NOT OPERATE THE THERMOMETER NEAR LARGE ELECTROMAGNETIC FIELDS.
Usage in such environments may cause irreparable damage or incorrect measurement.

Usage Warnings / Cautions ⊘ — Warning ❗ — Caution

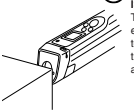


AVOID MEASURING SHINY OBJECTS.
Shiny objects, of which emissivity value is near 0, reflect surrounding temperatures. As this thermometer's sensitivity to emissivity is fixed at 0.95 / 0.70, the displayed temperature could differ from the actual temperature of objects, which has different emissivity value. (See "Emissivity" on page 14)

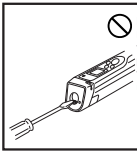


DO NOT DROP THE THERMOMETER OR APPLY VIOLENT SHOCKS.
This product has shock resistant structure to survive under normal usage, but throwing or falling the unit intentionally with force may cause irreparable damage.

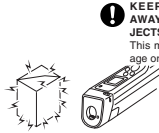
DO NOT USE ANY BATTERY OTHER THAN SPECIFIED.
This may cause irreparable damage or incorrect measurement.



DO NOT LET THE THERMOMETER TOUCH THE OBJECT THAT IS BEING MEASURED.
The unit is a non-contact thermometer. Touching or getting too close to the objects with high temperatures may cause irreparable damage or incorrect measurement.



DO NOT TOUCH THE FILTER.
Do not touch the filter with something hard or things with sharp points, which may damage the filter. Damaged filter causes incorrect measurement.



KEEP THE THERMOMETER AWAY FROM CHARGED OBJECTS.
This may cause irreparable damage or incorrect measurement.

Specifications

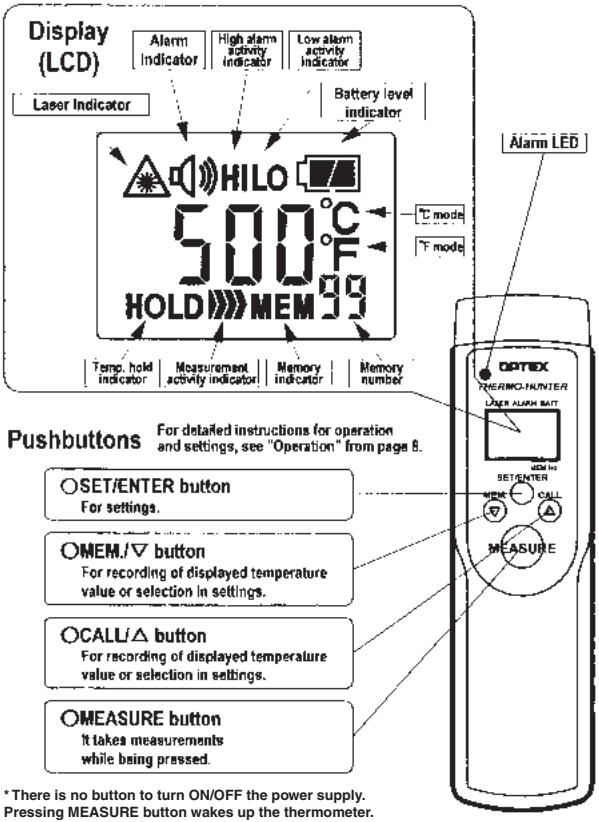
Model	PT-5LD
Measurement range	0 ～ 500 ˚C
Display range	–10 ～ 650 ˚C
Field of view	ϕ25 / 300mm (D : S=15 : 1)
Optics	mirror / silicon filter
Sensing element	Thermopile
Spectral response	8–14 μ m
Response time	0.7 sec. / 90%
Accuracy ($\varepsilon \fallingdotseq 0.95$)	0～200 ˚C : ±2 ˚C, 201 ˚C～ : ±1 %
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 : Trial use only)
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



Pushbuttons For detailed instructions for operation and settings, see "Operation" from page 8.

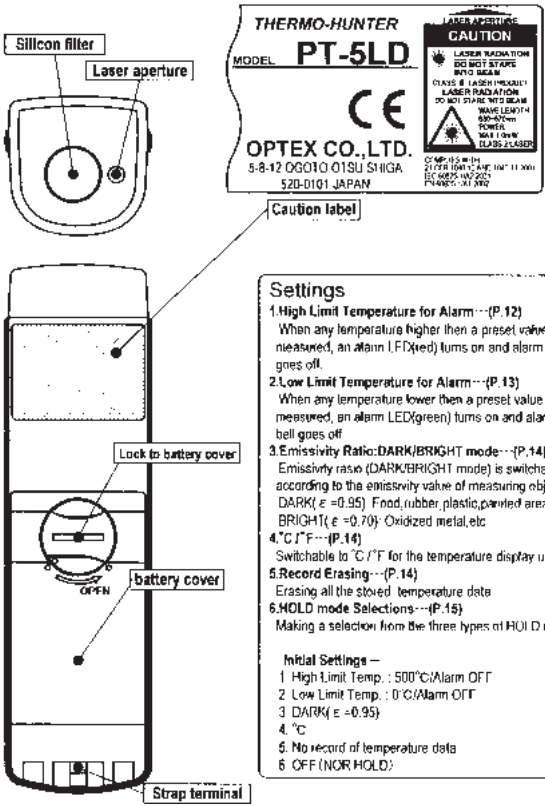
○SET/ENTER button
For settings.

○MEM./▽ button
For recording of displayed temperature value or selection in settings.

○CALL/△ button
For recording of displayed temperature value or selection in settings.

○MEASURE button
It takes measurements while being pressed.

*** 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.



Settings

1.High Limit Temperature for Alarm···(P.12)
When any temperature higher then a preset value is measured, an alarm LED(red) turns on and alarm bell goes off.

2.Low Limit Temperature for Alarm···(P.13)
When any temperature lower then a preset value is measured, an alarm LED(green) turns on and alarm bell goes off

3.Emissivity Ratio:DARK/BRIGHT mode···(P.14)
Emissivity ratio (DARK/BRIGHT mode) is switchable according to the emissivity value of measuring object.
DARK(ε =0.95) Food,rubber,plastic,painted area etc
BRIGHT(ε =0.70) Oxidized metal,etc

4.°C /°F···(P.14)
Switchable to °C /°F for the temperature display unit.

5.Record Erasing···(P.14)
Erasing all the stored temperature data

6.HOLD mode Selections···(P.15)
Making a selection from the three types of HOLD mode

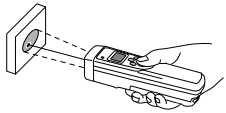
Initial Settings –
1 High Limit Temp. : 500°C/Alarm OFF
2 Low Limit Temp. : 0°C/Alarm OFF
3 DARK(ε =0.95)
4 °C
5 No record of temperature data
6 OFF (NOR HOLD)

Operation

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

● Normal Measurement

[Starting Normal Measurement]

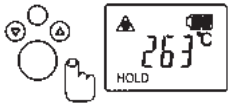


①Press (MEASURE) button to turn on the power supply. A laser beam is emitted and the measurement starts. (In the Normal Measurement mode, the unit takes measurements while (MEASURE) button is pressed.)

②Point 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.

③In the Normal Measurement mode, the measurement indication " " is shown on the LCD display and a laser indicator blinks.

[Quitting Normal Measurement / HOLD mode]



①Release (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

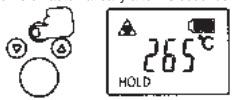
[Starting Continuous Measurement]

①Press 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.)

②During the Continuous Measurement mode, LCD display shows "ct".

[Quitting Continuous Measurement]

①To 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.

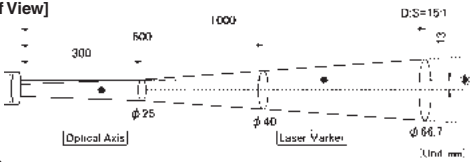


Attention : The laser beam is constantly emitted during Continuous Measurement mode. Be careful of it while operating the thermometer.

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**

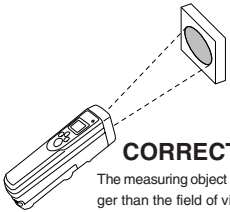
ex.) The average temperature of surface of the circle 25 mm in diameter is measured at a distance of 300 mm away from the measuring object.

* 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)].

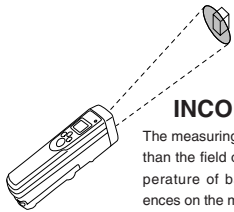
[For Correct Measurement]

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.



CORRECT

The measuring object is bigger than the field of view.



INCORRECT

The measuring object is smaller than the field of view. The temperature of background influences on the measuring value.

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)

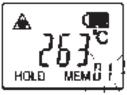
Memory Function

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

[Recording / MEM. mode]

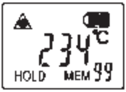
①Press and hold (MEM./▽) button for two seconds or more to record the temperature value displayed at the time when you start pressing the button. Memory function is available in Normal Measurement mode, Continuous Measurement mode or HOLD mode (refer to page 8).

②When the temperature data is recorded, "**MEM**" sign and the memory number (01 to 99) on LCD display blink.



③A maximum of 99 points of temperature data can be recorded in the memory.

④When you try to enter the memory over 100 points, the display shows "**FULL**".



[Recalling / CALL Mode]

①Press and hold (CALL/△) 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.

②By pressing (MEM./▽) or (CALL/△) button, you can select the memory number to show the stored temperature value corresponding to the memory number.

③To 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.

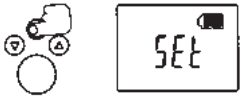
*** To erase all the stored records, see "Record Erasing" on page 14.**

Settings

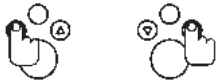
This section gives you an explanation on how to set the following functions: "High Limit Temperature for Alarm", "Low Limit Temperature for Alarm", "Emissivity Ratio (DARK/BRIGHT mode)", "˚C/˚F mode" and "Recorded Erasing" "HOLD mode Selections".

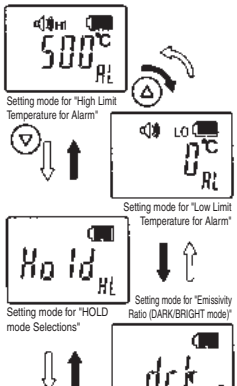
[Selecting Functions]

①Press 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.)



②By pressing (CALL/△) or (MEM./▽) button, you can select functions as shown in the right illustrations.





③When 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.

④When 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".)

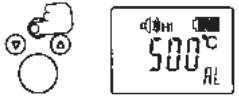
⑤To quit the setting mode, press (MEASURE) button.

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"]

①Enter the setting mode for "High Limit Temperature for Alarm" according to the procedure described in page 11. The initial setting is at 500 ˚C.

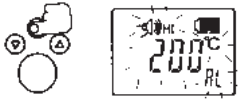


Setting mode for "High Limit Temperature for Alarm" (Initial setting: 500 ˚C)

②Press ▽ or △ button in the setting mode to change the temperature vale, which your need alarm at.

Changing the temperature value to 200 ˚C by using ▽/△ button.

③Press SET/ENTER button to set the displayed value as the High Limit Temperature for Alarm.

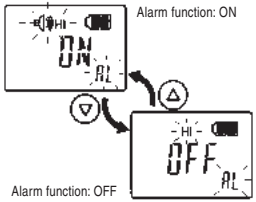


Setting the temperature value with SET/ENTER button.

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

[Turning ON/OFF Alarm Function]

①When the High Limit Temperature setting is completed, the setting mode for ON/OFF Alarm Function appears. Press ▽ or △ button to select ON or OFF.



Alarm function: ON

Alarm function: OFF

②Press 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.

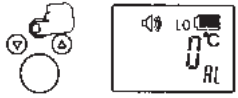
Setting — "Low Limit Temperature for Alarm"

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"]

①Enter 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 set ting is at 0 ˚C.

②Press ▽ or △ button in the setting mode to change the temperature vale, which your need alarm at.



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

Changing the temperature value to 10 ˚C by using ▽/△ button.

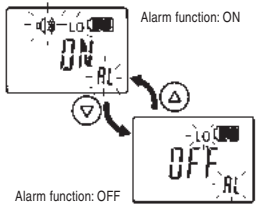
③Press SET/ENTER button to set the displayed value as the Low Limit Temperature for Alarm.

Setting the temperature value with 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]

①When the Low Limit Temperature setting is completed, the setting mode to ON/OFF Alarm Function appears. Press ▽ or △ button to select ON or OFF.



Alarm function: ON

Alarm function: OFF

②Press 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"

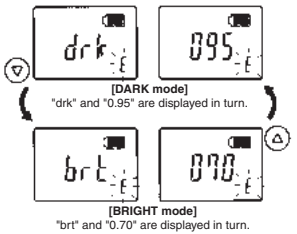
[Emissivity Ratio (DARK/BRIGHT mode)]

Emissivity (ε)
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 PT-5LD is fixed at two points, i.e., DARK (ε=0.95) and BRIGHT (ε=0.70).
Example : DARK (ε=0.95): Food, rubber, plastic, painted area, etc.
BRIGHT (ε=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 (ε=0.95) on the surface of the measuring object to cover the measuring area, if possible.

①Enter the setting mode for "Emissivity Ratio (DARK/BRIGHT mode)" according to the procedure described in page 11. The initial setting is DARK (ε=0.95).

②Press ▽ or △ button in the setting mode to change the emissivity ratio (DARK or BRIGHT).

③Press SET/ENTER button to set the emissivity ratio.



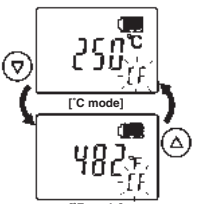
[Setting "˚C/˚F mode"]

①Enter the setting mode for "˚C/˚F mode" according to the procedure described in page 11. The initial setting is ˚C.

②Press ▽ or △ button in the setting mode to choose the temperature display unit whether ˚C or ˚F mode.

③Press 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]

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

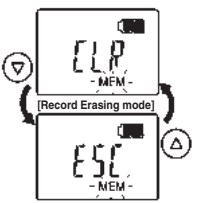
①Enter the setting mode for "Record Erasing" according to the procedure described in page 11.

②Press ▽ or △ button in the setting mode to select "CLR" sign on the display.

③Press SET/ENTER button, and all the recorded data are erased.

*** If you wish to cancel the Record Erasing, press ▽ button to select "ESC" sign on the display and press SET/ENTER button. Then, you can return to the setting mode again.**

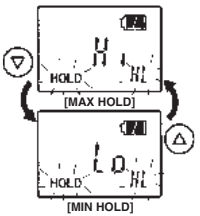
*** Please note that OPTEX is not liable for any loss of data.**



Setting — "HOLD made Selections"

[Setting "HOLD mode Selections"]

①Enter the setting mode for "HOLD mode Selections" according to the procedure described in page 11.
②Press ▽ or △ button in the setting mode to select ON or OFF. The initial setting is OFF. (NOR HOLD)
③Press SET/ENTER button to set ON or OFF.
④In case of ON, "HOLD mode Selections" can be available. Press ▽ or △ button to select the HOLD mode. (MAX or MIN).
⑤Press 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.	Clean the laser aperture referring "Main Unit" of "MAINTENANCE" described in page 16.
	Voltage for laser is insufficient.	Replace the battery with a new one. (A sign -b- blinks.) Otherwise install the battery correctly in the battery compartment.
Measured temperature value seems incorrect.	A filter unit is stained.	Clean the filter referring "Filter" of "MAINTENANCE" described in page 16.
	Field of view is deviated from the measuring object.	Center the laser beam on the measuring object by referring "Field of View" described in page 9.
	The measuring object is smaller than the field of view.	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 tenperature of a shiny metal sarface.	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.
	The thermometer is affected by considerable temperature fluctuation.	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.

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.

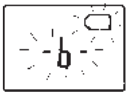
[Annual Inspection]

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

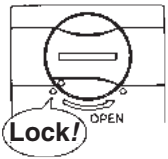
Battery

[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.



①Turn the lock for battery cover at the back of main unit counterclockwise to open the battery compartment.
②Much the"+" "–" polarities of the battery with the signs on the battery compartment.
③Close 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.