Portable Non-Contact Thermometer

Instruction Manual

THERMO-HUNTER PT-7LD

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Thank you very much for purchasing this product. This device is a non-contact hermometer 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 is thermometer.

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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-7LD 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.

Conformance to EU Directives

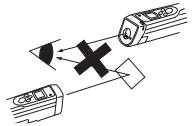
- This is a class A product. In residential areas it may cause radio interference, in which case the user may be required to take adequate measures to reduce interference.

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.

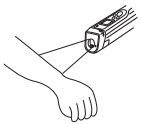
⚠CAUTION : This symbol signifies that improper usage may result in injuries or damage.

⚠ 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



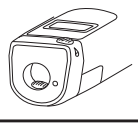
This product is not a clinical thermometer and therefore, can not be used for medical purposes.

⚠ CAUTION

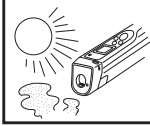
Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Safe Usage — Warnings & Cautions on Environment and Usage

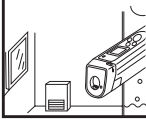
Environmental Warnings / Cautions ⃠ — Warning ❗ — Caution



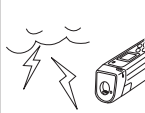
KEEP THE THERMOMETER AWAY FROM DROPPING WATER AND DO NOT USE IN WATER.
This sthermometerhas waterproofing, but it cannot be operated in the water. Water drops on the filter or the area around it maycause incorrect measurement. Wipe up the filter and the area around it completely before taking measurement.



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.

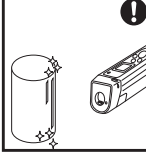


DO NOT EXPOSE THE THERMOMETER TO SUDDEN TEMPERATURE CHANGES.
Sudden temperature changes may cause incorrect measurement. Leave the thermometer for a while to let it reach stable temperature before taking measurement.

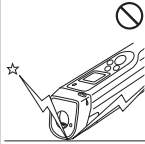


DO NOT OPERATE THE THERMOMETER NEAR LARGE ELECTROMAGNETIC FIELDS.
Usage in such environments may cause irreparable damage or incorrect measurement.

Usage Warnings / Cautions ⃠ — Warning ❗ — Caution

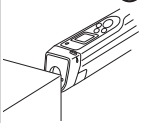


AVOID MEASURING SHINY OBJECTS.
Shiny objects reflect surrounding infrared energy.
Therefore, it results in incorrect measurement.

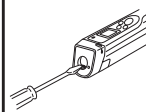


DO NOT DROP THE THERMOMETER OR APPLY VIOLENT SHOCKS.
This product has shock resistant structure to survive under normal usage, but throwing or falling the unit intentionally with force may cause irreparable damage.

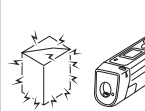
DO NOT USE ANY BATTERY OTHER THAN SPECIFIED.
This may cause irreparable damage or incorrect measurement.



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−7LD
Measurement range	−30.0 to 200.0℃
Display range	−40.0 to 220.0℃
Field of view	φ25 / 300 mm (D:S = 15:1)
Optics	Mirror / silicon filter
Sensing element	Thermopile
Spectral response	8 to 14 μm
Response time	0.7 Sec. / 90%
Accuracy (ε ≒ 0.95)	−30.0 to 0℃ : ±3.0℃、0.1 to 100.0℃ : ±1.0℃、100.1 to 200.0℃ : ±2.0℃ ※1
Repeatability	±1℃ of reading value
Display resolution	0.1℃
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	HOT (0.95) / COLD (0.85) Switchable
Power supply	9V alkaline battey, 6LR61/6LF22 (1 piece)
Battery life	12 Hours (With max load)
Ambient temperature	0 to 50℃
Ambient humidity	35% to 85%Rh (Without due condensation)
Storage temperature	−10 to 60℃
Protective structure	IP67
Material	ABS (Antibacterial)
Dimension	H x W x D=160 x 44 x 42mm
Weight	200g (Incl. Battery)
Applicable regulations	EMC Directive(2014/30/EU),RoHS Directive(2011/65/EU),China RoHS(MIIT Order No.32) FDA (21 CFR 1040.10 and 1040.11) (expect for deviations pursuant to Laser Notice No.50) Consumer product safety Act.(PSC Mark) ※2
Applicable standards	EN 61326-1:2013, IEC 60825-1:2007,2014

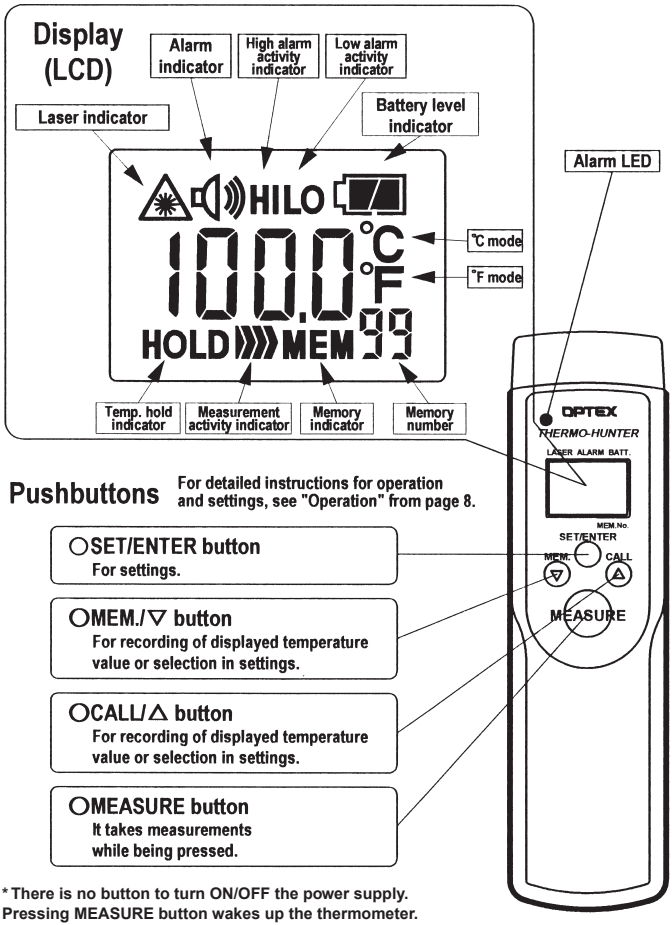
※1 The measurement accuracy in the specification is limited to the calibration conditions of our factory.
※2 This product is classified as Class 2 by IEC 60825-1: 2007 according to Laser Notice No.50, FDA Guidance Document.

Accessories : Quick Reference Card, Instruction Manual (This book)

Option : Black body tape

For China RoHS, please refer to http://www.optex-fa.com/rohs_cn/

Name of Components



Pushbuttons

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

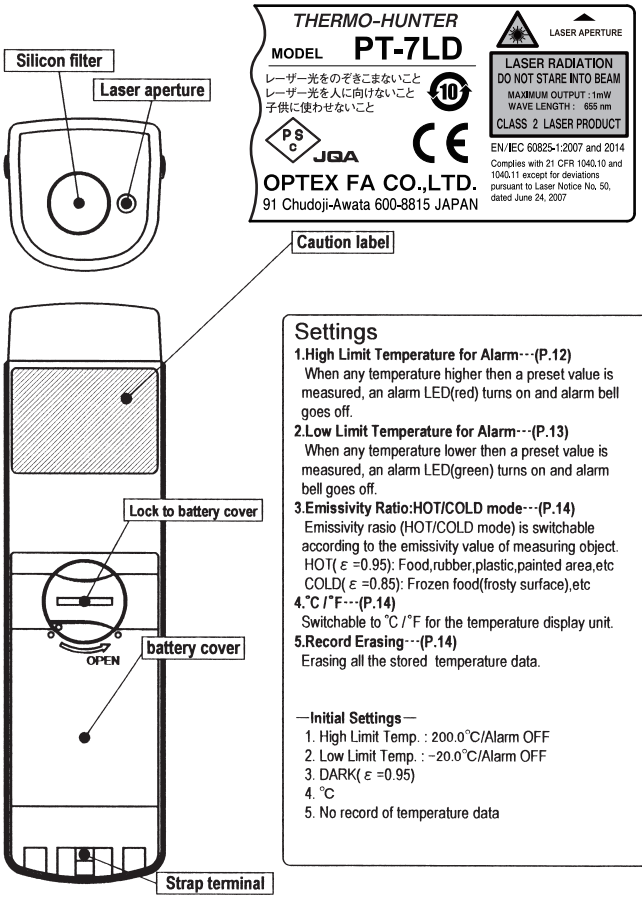
○SET/ENTER button
For settings.

○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:HOT/COLD mode···(P.14)
Emissivity rasio (HOT/COLD mode) is switchable according to the emissivity value of measuring object.
HOT(ε =0.95): Food,rubber,plastic,painted area,etc
COLD(ε =0.85): Frozen food(frosty surface),etc

4.℃ /℉···(P.14)
Switchable to ℃ /℉ for the temperature display unit.

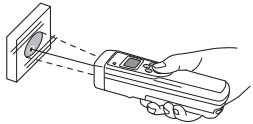
5.Record Erasing···(P.14)
Erasing all the stored temperature data.

—Initial Settings—
1. High Limit Temp. : 200.0℃/Alarm OFF
2. Low Limit Temp. : −20.0℃/Alarm OFF
3. DARK(ε =0.95)
4. ℃
5. No record of temperature data

Operation

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

● Normal Measurement



[Starting Normal Measurement]

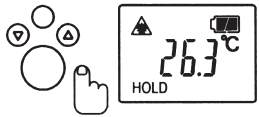
① Press (MEASURE) button to turn on the power supply. A laser beam is emitted and the measurement starts. (In the Normal Measurement mode, the unit takes measurements while (MEASURE) button is pressed.)

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.

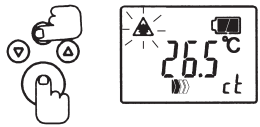


● Continuous Measurement

[Starting Continuous Measurement]

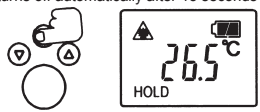
① Press and hold both of (MEASURE) button and (SET/ENTER) button simultaneously for two seconds or more, then the Continuous Measurement mode switched on. (In the Continuous Measurement mode, the thermometer keeps measuring temperatures without pressing (MEASURE) button.)

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



[Quitting Continuous Measurement]

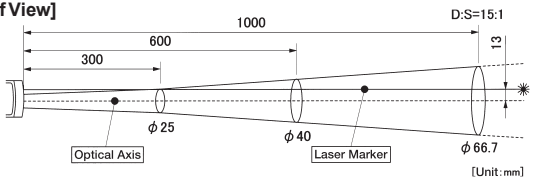
① To quit the Continuous Measurement mode, press and hold (SET/ENTER) button for two seconds or more. Then, it switches to HOLD mode. The power supply turns off automatically after 15 seconds in the HOLD mode.



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**

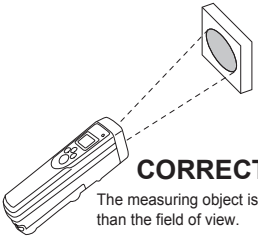
ex.) The average temperature of surface of the circle 25 mm in diameter is measured at a distance of 300 mm away from the measuring object.

* 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)].

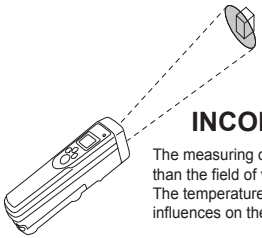
[For Correct Measurement]

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.

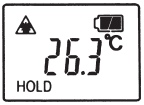
Note. If any water drop is on the filter and/or the area around it, the thermometer measures temperature of the water drop, which results in incorrect measurement. Wipe up the filter and the area around it completely before taking measurement. (See "Maintenance" on page 16)

Memory Function

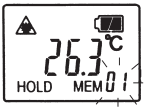
The non-contact thermometer PT-7LD can store 99-point temperature data in memory. Operate according to the following procedure:

[Recording / MEM. mode]

① Press 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).

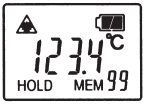


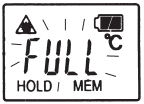
② When the temperature data is recorded, "**MEM**" sign and the memory number (01 to 99) on LCD display blink.



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

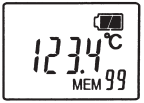
④ When you try to enter the memory over 100 points, the display shows "**FULL**".



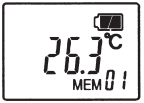


[Recalling / CALL Mode]

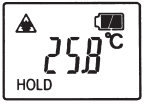
① Press and hold (CALL/△) button for two seconds or more in HOLD Mode (refer to page 8), and "**CALL**" sign appears on the LCD display. In CALL (recalling) mode, the last record of temperature data and the corresponding memory number are shown on the display.



② By pressing (MEM./▽) or (CALL/△) 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.



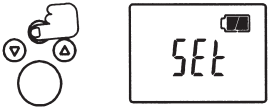
*** To erase all the stored records, see "Record Erasing" on page 14.**

Settings

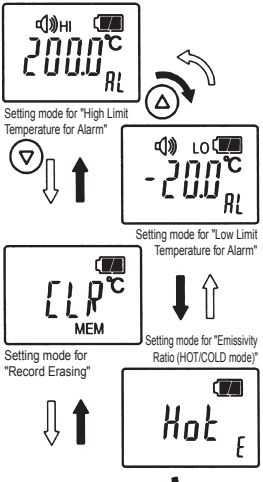
This section gives you an explanation on how to set the following functions: "High Limit Temperature for Alarm", "Low Limit Temperature for Alarm", "Emissivity Ratio (HOT/COLD mode)", "˚C/˚F mode" and "Recorded Erasing".

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

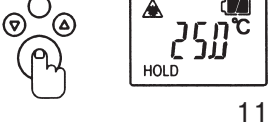


③ When the name of the function you desire appears on the display, press (SET/ENTER) button to set. Then, you can enter the detailed setting mode.

- "High Limit Temperature for Alarm" setting, refer to page 12.
- "Low Limit Temperature for Alarm" setting, refer to page 13.
- "Emissivity Ratio (HOT/COLD mode)", "˚C/˚F mode" and "Record Erasing" settings, refer to page 14.

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.

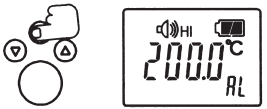


Setting — "High Limit Temperature for Alarm"

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"]

① Enter the setting mode for "High Limit Temperature for Alarm" according to the procedure described in page 11. The initial setting is at 200.0 ˚C.



Setting mode for "High Limit Temperature for Alarm" (Initial setting: 200.0 ˚C)

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

Changing the temperature value to 120.0 ˚C by using ▽/△ button.

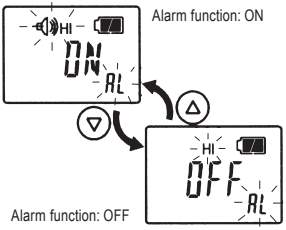
③ Press SET/ENTER button to set the displayed value as the High Limit Temperature for Alarm.

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]

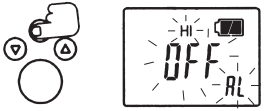
① When the High Limit Temperature setting is completed, the setting mode for ON/OFF Alarm Function appears. Press ▽ or △ button to select ON or OFF.



Alarm function: ON

Alarm function: OFF

② Press 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.



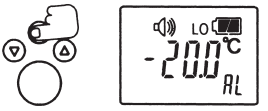
Setting — "Low Limit Temperature for Alarm"

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

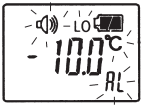
[Setting "Low Limit Temperature for Alarm"]

① 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 set ting is at -20.0 ˚C.

② Press ▽ 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: -20.0 ˚C)



Changing the temperature value to -10.0 ˚C by using ▽ / △ button.

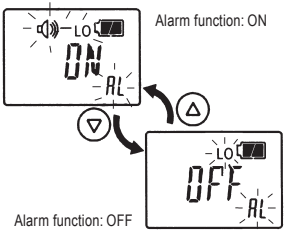
③ Press SET/ENTER button to set the displayed value as the Low Limit Temperature for Alarm.

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]

① When 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

② Press 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 (HOT/COLD mode)", "˚C / ˚F mode" and "Record Erasing"

[Emissivity Ratio(HOT/COLD mode)]

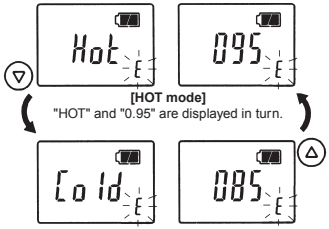
Emissivity (ε)
Emissivity is a value that indicates the infrared energy emitted from the surface of an object. Every object has its own emissivity value and it varies depending on the surface condition or the temperature of the object. The emissivity ratio of PT-7LD is fixed at two points, i.e., HOT (ε=0.95) and COLD (ε=0.85).
Example : HOT (ε=0.95): Food, rubber, plastic, painted area, etc.
COLD (ε=0.85): Frozen food (frosty surface), 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 HOT/COLD 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.

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

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

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



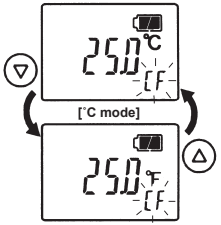
[Setting "˚C/˚F mode"]

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

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

③ Press 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.

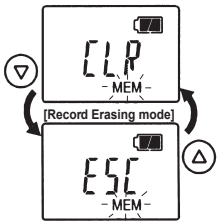
① Enter the setting mode for "Record Erasing" according to the procedure described in page 11.

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

③ Press 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.**



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 alkaline 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 alkaline 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 temperature 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.

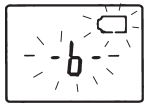
[Annual Inspection]

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

Battery

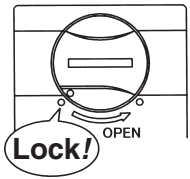
[Installing Battery]

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

Portable Non-Contact Thermometer

Instruction Manual

THERMO-HUNTER PT-5LD

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TEL: +81-75-325-1314 FAX: +81-75-325-2936

Printed in JAPAN 0806970 2018/6

Thank you very much for purchasing this product. 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.

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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.

Conformance to EU Directives

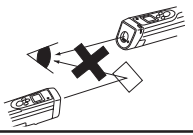
- This is a class A product. In residential areas it may cause radio interference, in which case the user may be required to take adequate measures to reduce interference.

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.

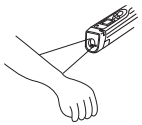
⚠CAUTION : This symbol signifies that improper usage may result in injuries or damage.

⚠ 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



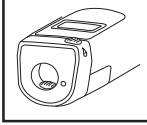
This product is not a clinical thermometer and therefore, can not be used for medical purposes.

⚠ 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 waterproof-ing, but it cannot be operated in the water. Water drops on the filter or the area around it may cause in- correct 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 THER-MOMETER TO SUDDEN TEM-PERATURE 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 THERMO-METER NEAR LARGE ELECTRO-MAGNETIC FIELDS.

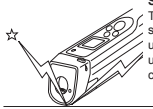
Usage in such environments may cause irreparable damage or in-correct measurement.

Usage Warnings / Cautions ⃠ — Warning ! — Caution

AVOID MEASURING SHINY OB-JECTS.

Shiny objects reflect surrounding infrared energy.

Therefore, it results in incorrect measurement.

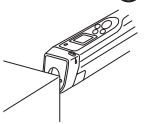


DO NOT DROP THE THERMO-METER OR APPLY VIOLENT SHOCKS.

This product has shock resistant structure to survive under normal usage, but throwing or falling the unit intentionally with force may cause irreparable damage.

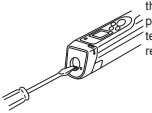
DO NOT USE ANY BATTERY OTHER THAN SPECIFIED.

This may cause irreparable dam-age or incorrect measurement.



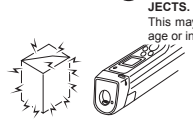
DO NOT LET THE THERMO-METER TOUCH THE OBJECT THAT IS BEING MEASURED.

The unit is a non-contact thermo-meter. 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 some-thing hard or things with sharp points, which may damage the fil-ter. Damaged filter causes incor-rect measurement.



KEEP THE THERMOMETER AWAY FROM CHARGED OB-JECTS.

This may cause irreparable dam-age or incorrect measurement.

Specifications

Model	PT−5LD
Measurement range	0 to 500℃
Display range	−10 to 650℃
Field of view	ϕ25 / 300 mm (D:S = 15:1)
Optics	Mirror / silicon filter
Sensing element	Thermopile
Spectral response	8 to 14 μ m
Response time	0.7 Sec. / 90%
Accuracy（ε ≒0.95）	0 to 200℃：±2℃、201℃ to：±1% of reafing value ※1
Repeatability	±1℃ of reading value
Display resolution	1℃
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	HOT（ε=0.95）/ COLD（0.70）Switchable
Power supply	9V alkaline battery 6LR61/6LF22 (1 piece)
Battery life	12 Hours (With max load)
Ambient temperature	0 to 50℃
Ambient humidity	35% to 85%Rh（Without due condensation）
Storage temperature	−10 to 60℃
Protective structure	IP67
Material	ABS (Antibacterial)
Dimension	H x W x D=160 x 44 x 42mm
Weight	200g (Incl. Battery)
Applicable regulations	EMC Directive(2014/30/EU),RoHS Directive(2011/65/EU),China RoHS(MIIT Order No.32) FDA (21 CFR 1040.10 and 1040.11) (expect for deviations pursuant to Laser Notice No.50) Consumer product safety Act.(PSC Mark) ※2
Applicable standards	EN 61326-1:2013, IEC 60825-1:2007,2014

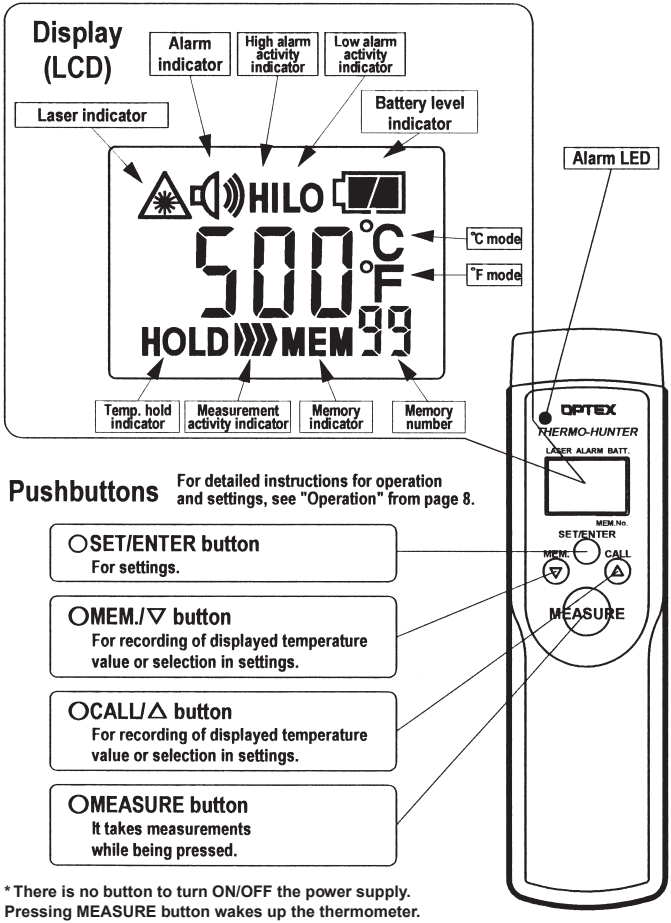
※1 The measurement accuracy in the specification is limited to the calibration conditions of our factory.
※2 This product is classified as Class 2 by IEC 60825-1: 2007 according to Laser Notice No.50, FDA Guidance Document.

Accessories : Quick Reference Card, Instruction Manual (This book)

Option : Black body tape

For China RoHS, please refer to http://www.optex-fa.com/rohs_cn/

Name of Components



Pushbuttons

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

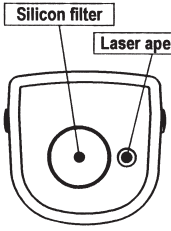
○SET/ENTER button
For settings.

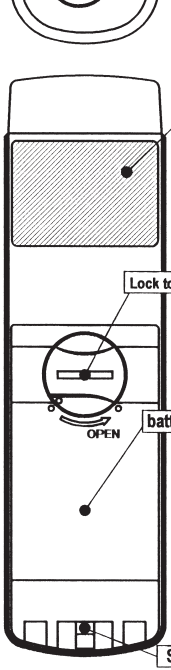
○MEM./▽ button
For recording of displayed temperature value or selection in settings.

○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 rasio (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.℃/℉---(P.14)
Switchable to ℃/℉ for the temperature display unit.

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

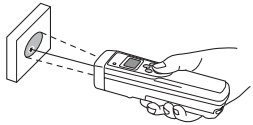
6.HOLD mode Selections---(P.15)
Making a selection from the three types of HOLD mode.

—Initial Settings—
1. High Limit Temp. : 500℃/Alarm OFF
2. Low Limit Temp. : 0℃/Alarm OFF
3. DARK(ε =0.95)
4. ℃
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]

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.)

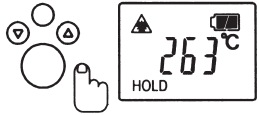
② Point the laser beam at a measuring object and aim it at the center of the area to be measured. For the distance from this thermometer to the measuring object, refer to page 9.

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)

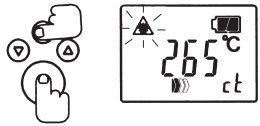


● Continuous Measurement

[Starting Continuous Measurement]

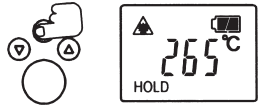
① Press and hold both of (MEASURE) button and (SET/ENTER) button simultaneously for two seconds or more, then the Continuous Measurement mode switched on. (In the Continuous Measurement mode, the thermometer keeps measuring temperatures without pressing (MEASURE) button.)

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



[Quitting Continuous Measurement]

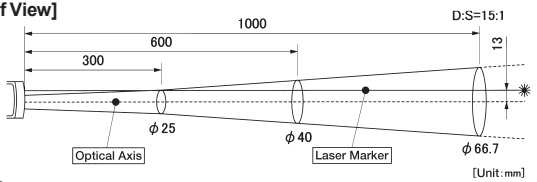
① To quit the Continuous Measurement mode, press and hold (SET/ENTER) button for two seconds or more. Then, it switches to HOLD mode. The power supply turns off automatically after 15 seconds in the HOLD mode.



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**

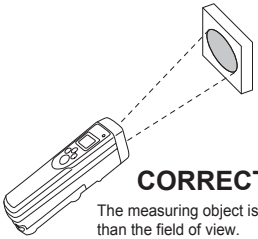
ex.) The average temperature of surface of the circle 25 mm in diameter is measured at a distance of 300 mm away from the measuring object.

* 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)].

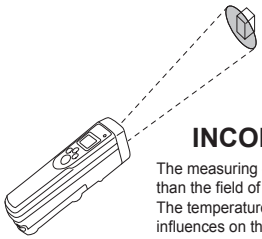
[For Correct Measurement]

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.

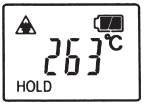
Note. If any water drop is on the filter and/or the area around it, the thermometer measures temperature of the water drop, which results in incorrect measurement. Wipe up the filter and the area around it completely before taking measurement. (See "Maintenance" on page 16)

Memory Function

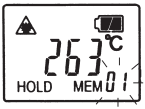
The non-contact thermometer PT-5LD can store 99-point temperature data in memory. Operate according to the following procedure:

[Recording / MEM. mode]

① Press 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).

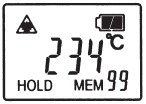


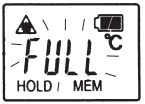
② When the temperature data is recorded, "**MEM**" sign and the memory number (01 to 99) on LCD display blink.



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

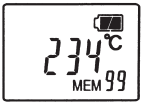
④ When you try to enter the memory over 100 points, the display shows "**FULL**".



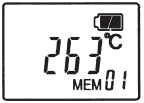


[Recalling / CALL Mode]

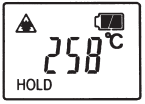
① Press and hold (CALL/△) button for two seconds or more in HOLD Mode (refer to page 8), and "**CALL**" sign appears on the LCD display. In CALL (recalling) mode, the last record of temperature data and the corresponding memory number are shown on the display.



② By pressing (MEM./▽) or (CALL/△) 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.



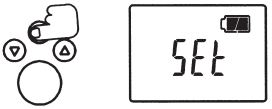
*** To erase all the stored records, see "Record Erasing" on page 14.**

Settings

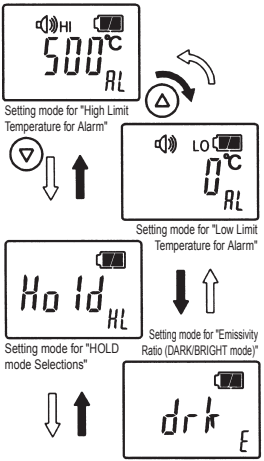
This section gives you an explanation on how to set the following functions: "High Limit Temperature for Alarm", "Low Limit Temperature for Alarm", "Emissivity Ratio (DARK/BRIGHT mode)", "˚C/˚F mode" and "Recorded Erasing" "HOLD mode Selections".

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

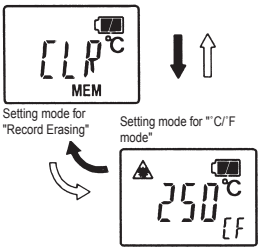


③ When the name of the function you desire appears on the display, press (SET/ENTER) button to set. Then, you can enter the detailed setting mode.

- "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.

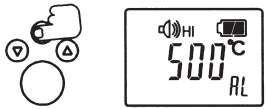


Setting — "High Limit Temperature for Alarm"

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"]

① 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.

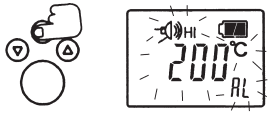


Setting mode for "High Limit Temperature for Alarm" (Initial setting: 500 ˚C)

② Press ▽ 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.

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

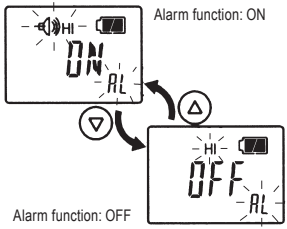


Setting the temperature value with SET/ENTER button.

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

[Turning ON/OFF Alarm Function]

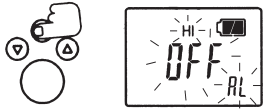
① When the High Limit Temperature setting is completed, the setting mode for ON/OFF Alarm Function appears. Press ▽ or △ button to select ON or OFF.



Alarm function: ON

Alarm function: OFF

② Press 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.



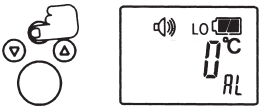
Setting — "Low Limit Temperature for Alarm"

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

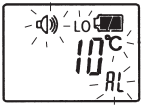
[Setting "Low Limit Temperature for Alarm"]

① 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 set ting is at 0 ˚C.

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



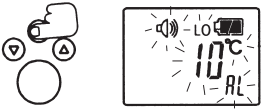
Setting mode for "High Limit Temperature for Alarm" (Initial setting: 0 ˚C)



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

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

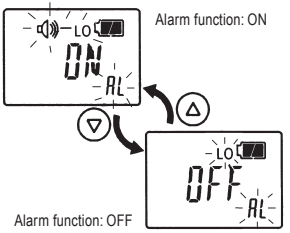
Attention: The "Low Limit Temperature for Alarm" cannot be set at higher temperature than "High Limit Temperature for Alarm".



Setting the temperature value with SET/ENTER button.

[Turning ON/OFF Alarm Function]

① When 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

② Press 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)]

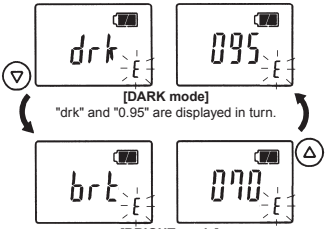
Emissivity (ε)
Emissivity is a value that indicates the infrared energy emitted from the surface of an object. Every object has its own emissivity value and it varies depending on the surface condition or the temperature of the object. The emissivity ratio of PT-5LD is fixed at two points, i.e., DARK (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.

① Enter 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).

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

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



[DARK mode]
"drk" and "0.95" are displayed in turn.

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

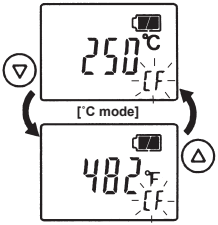
[Setting "˚C/˚F mode"]

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

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

③ Press 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.**



[˚C mode]

[˚F 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.

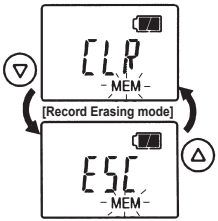
① Enter the setting mode for "Record Erasing" according to the procedure described in page 11.

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

③ Press 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.**



[Record Erasing mode]

[Record Erasing Cancel mode]

Setting — "HOLD made Selections"

[Setting "HOLD mode Selections"]

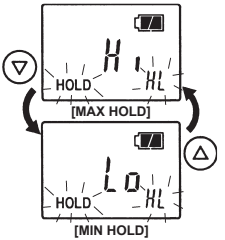
① Enter the setting mode for "HOLD mode Selections" according to the procedure described in page 11.

② Press ▽ or △ button in the setting mode to select ON or OFF. The initial setting is OFF. (NOR HOLD)

③ Press SET/ENTER button to set ON or OFF. In case of ON, "HOLD mode Selections" can be available.

④ Press ▽ or △ button to select the HOLD mode. (MAX or MIN).

⑤ Press 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 alkaline 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 alkaline 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 temperature 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.

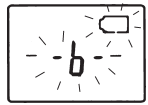
[Annual Inspection]

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

Battery

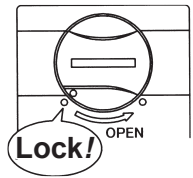
[Installing Battery]

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

Portable Non-Contact Thermometer

Instruction Manual

THERMO-HUNTER PT-2LD

Thank you very much for purchasing this product. 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.

Introduction

- Please make sure the model you purchased is the one you specified.
- Please read the manual thoroughly before using the THERMO-HUNTER PT-2LD for correct usage.
- After reading this manual, please retain it for future reference.
- OPTEX FA 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.

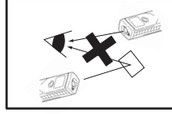
OPTEX FA CO.,LTD.
91 Chudoji-Awata-cho Shimogyo-ku Kyoto 600-8815 JAPAN
TEL: +81-75-325-1314 FAX: +81-75-325-2936

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.

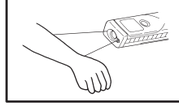
⚠ CAUTION: **This symbol signifies that improper usage may result in injuries or damage.**

⚠ 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

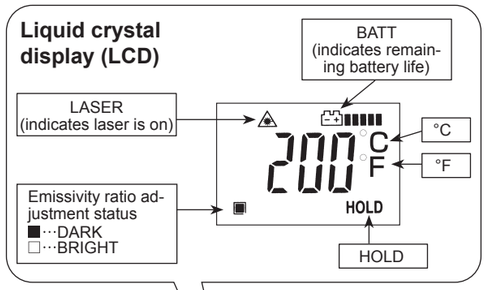


This product is not a clinical thermometer and therefore, can not be used for medical purposes.

⚠ CAUTION

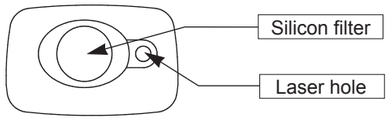
Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

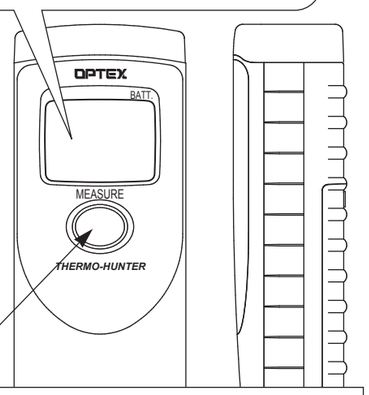
Operation instructions



Operation instruction

1) Set two AA (SUM-3) batteries into the battery box which is located on the back of the thermometer.
2) Operates while pushing the MEASURE button. Laser sighting and Backlight is given by the same button.
3) After releasing the button, the final measured value will appear on the display for 20 seconds before the thermometer automatically switches off.

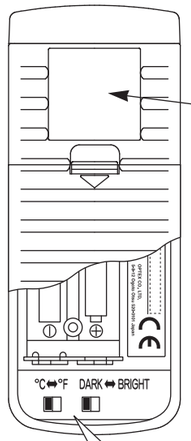




MEASURE button

- Push to operate and measure. It operates while pushing, and will automatically go off in 20 seconds after releasing the button.
- MEASURE button should be depressed to activate the laser beam and the release of pressure from button would shut off the laser beam. This function is provided instead of beam attenuator.

Caution label



DIP switches

①°C/°F
Use this switch to change between the two different temperature systems.

②DARK/BRIGHT
Use this switch to adjust the emissivity ratio. Set this switch in accordance with the emissivity ratio of the object being measured.

DARK…Emissivity ratio is set to blackish objects (nominal 0.95)

BRIGHT…Emissivity ratio is set to whitish objects (nominal 0.70)

The factory settings of the DIP switches are DARK and °C. Change the DIP switch setting according to your measuring purpose.

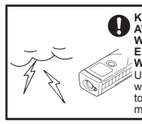
Safe Usage —Warnings & Cautions on Environment and Usage

Environmental Warnings / Cautions ⃠ — Warning ❗ — Caution

KEEP THE THERMOMETER AWAY FROM DROPPING WATER AND DO NOT USE IN WATER.
This thermometer is not waterproof.

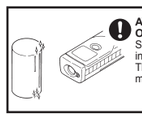
KEEP THE THERMOMETER AWAY FROM DIRECT SUNLIGHT, DUST, HIGH TEMPERATURES AND HIGH HUMIDITY DURING USE AND STORAGE.
Otherwise, the optical lens will become dirty or damaged. Such usage or storage will result in incorrect measurement.

DO NOT APPLY SUDDEN TEMPERATURE CHANGES TO THE THERMOMETER.
Sudden temperature changes may cause incorrect measuring results in such cases, leave the thermometer for a moment to let it retain to a stable condition prior to the next measurement.

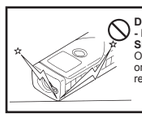


KEEP THE THERMOMETER AWAY FROM PRODUCTS WHICH PRODUCE STRONG ELECTROMAGNETIC WAVES.
Usage in such environments will cause irreparable damages to the unit and in-correct measurements.

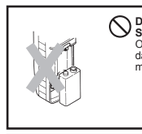
Usage Warnings / Cautions ⃠ — Warning ❗ — Caution



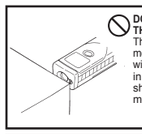
AVOID MEASURING SHINY OBJECTS.
Shiny objects reflect surrounding infrared energy.
Therefore, it results in incorrect measurement.



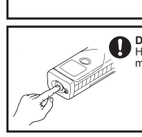
DO NOT DROP THE THERMO - METER OR APPLY VIOLENT SHOCKS.
Otherwise, irreparable damages or incorrect measurements will result.



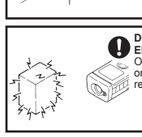
DO NOT USE WITH NON-STANDARD VOLTAGE.
Otherwise, irreparable damages or incorrect measurement will result.



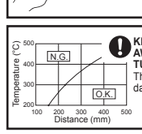
DO NOT TOUCH TO THE OBJECT THAT IS BEING MEASURED.
The unit is a non-contact thermometer. Touching the unit to objects with high temperatures will result in irreparable damages in the shape of the unit and incorrect measurements.



DO NOT TOUCH THE FILTER.
Hands off the filter otherwise measuring error might come.



DO NOT USE NEAR OBJECTS ELECTRICALLY CHARGED.
Otherwise, irreparable damages or incorrect measurements will result.



KEEP THE THERMOMETER AWAY FROM HIGH-TEMPERATURE OBJECT.
This may cause irreparable damage or incorrect measurement.

Maintenance

Filter Dust, dirt and scratches on the filter cause incorrect measurements. In case of dirty filter please remove the dust on the lens with a blower etc. for lens cleaning use.

Main Unit The main unit is made of ABS. When it becomes dirty, lightly wipe with a soft cloth which has been soaked in soapy neutral and then well wrung. Do not apply chemical solvents such as thinner, benzine and alcohol to remove them since these chemicals may cause erosion of the casing surface, or disappearance of printed characters.

Check We recommend that you check the calibration once a year. Please inquire at your local dealer for service.

Batteries

1) Battery box is located on the back of the thermometer.
2) Set the batteries into the battery box in the correct direction according to the polarity marks in the box. Replace the batteries when the battery life indicator starts blinking. Replace both batteries with new ones to avoid using old and new batteries together.

Caution

1) Do not throw used batteries into a fire. Do not recharge them.
2) Follow the local laws or regulations when disposing the batteries.
3) Take the batteries out of the thermometer when you do not use for a long time.

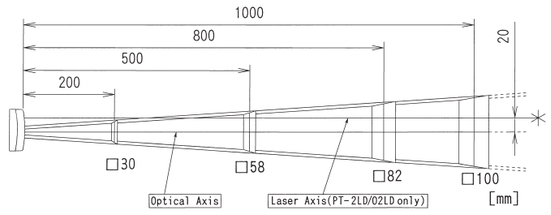
Reference

○ Emissivity ratio (ε)

The emissivity ratio is the rate of the energy emitted from the surface of the object. All objects possess a particular emissivity ratio which changes according to the object's surface conditions or temperature.
Our thermometer allows the emissivity ratio to be set at a fixed rate, enabling the surface temperatures of the following objects to be almost precisely measured
0.95(DARK)…rubber, plastic, paper, food, painted surfaces, etc.
0.70(BRIGHT)… oxidized metallic surfaces, etc. can be measured correctly.
In the case of objects with different emissivity ratios than the objects listed above, deviation of measurement will occur. In such cases, take their figures as approximate values by placing our separately sold black tape (ε=0.95) onto the object to be measured, the object can be almost precisely measured.

Conformance to EU Directives
- This in a class A product. In residential areas it may cause radio interference, in which case the user may be required to take adequate measures to reduce interference.

Field of View



※ Axis of the laser is located 20mm left from the optical axis.
The size of the object to be measured must be sufficiently bigger than the measuring area shown in the above illustration.

Troubleshooting

Problems	Cause	Solution
No readout	No battery or wrong setting of batteries.	Replace the batteries or set them again in the correct direction
Laser doesn't appear, it is dark	Dirt on the laser hole.	Wipe to clean the hole.
	Insufficient battery for driving laser.	Replace the batteries or set them again in the correct direction.
The measured figure seems incorrect	Dirt on the filter.	Clean the filter referring to the maintenance clause of this manual.
	The target is not aligned to optical axis.	Make sure target size and distance referring Field of View chart.
	There is some object emitting high temperatures near the object to be measured	Cover such heat source.
	The object has a lustrous metallic surface.	An error in reading is inevitable. Use another optex thermometer with variable emissivity system.
The measured figure is not stable	The unit is affected by rapid environmental temperature changes	Leave the unit to get it familiar with surrounding temperature.

If the above solutions do not correct the problems, the thermometer might be defective. In this case, please contact your local dealer for service.

Specifications

Model	PT-2LD
Measuring range	-40 to 510℃ (-40 to 950°)
Display range	-51 to 538℃ (-60 to 1000°F)
Field of View	□100 / 1000mm(D:S = 10:1)square spot
Optics	mirror / silicon filter
Sensing element/Wavelength	thermopile / 8 to 14μm
Response Time	800msec / 90%
Accuracy(ε=0.95, 25℃±3℃)	Less than 0℃: ±3℃, 0 to 200℃: ±2℃, 201℃ Over :±1℃ of reading value ※1
Repeatability	±1℃ (1°F) reading value
Display Resolution	1℃ (1°F)
Sighting method	Non-coaxial laser marker (CLASS 2)
Emissivity	0.95/0.7(Switchable)
Back-light function	Available
Battery type	AA x 2pcs
Battery life	Approx. 30hours (Alkaline)
Ambient temperature	0 to 50℃ (32 to 122°F)
Ambient humidity	35 to 85%RH(Without dew condensation)
Storage temperature	-10 to 60℃ (14 to 140°F)
Dimensions	H×W×D = 140×56×37mm
Weight	180g
Applicable regulations	EMC Directive(2014/30/EU),RoHS Directive(2011/65/EU),China RoHS(MIIT Order No.32) FDA(21CFR 1040.10 and 1040.11)(expect for deviations pursuant to Laser Notice No.50) ※2 Consumer product safety Act. (PSC Mark)
Applicable standards	EN 61326-1:2013, IEC 60825-1:2007,2014

※1 The measurement accuracy in the specification is limited to the calibration conditions of our factory.
※2 This product is classified as Class 2 by IEC 60825-1: 2007 according to Laser Notice No.50, FDA Guidance Document.

Option: Black body tape

For China RoHS, please refer to http://www.optex-fa.com/rohs_cn/

Portable Non-Contact Thermometer

Instruction Manual

THERMO-HUNTER PT-3S

The PT-3S Thermo-hunter is a non-contact thermometer that measures surface temperatures of objects by catching the infrared energy emitted by the target objects. Do not use to measure anything other than surface temperatures.

Thank you for purchasing Optex products.
- Please check to make sure the model you purchased is the model you specified.
- Please read the manual before using the PT-3S Thermohunter in order to use it correctly.
- After reading the manual, please be sure to keep it for future reference.

OPTEX FA CO., LTD.
91 Chudoji-Awata-cho Shimogyo-ku Kyoto
600-8815 JAPAN
TEL: +81-75-325-1314 FAX: +81-75-325-2936

"Take Care of the Environmet." This manual uses recycled paper. PRINTED IN JAPAN 0632-5 2008/2

Safe Usage

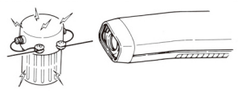
This instruction manual contains various warnings to ensure safe usage of the product and prevent damage and injury to you and other persons. Please be sure to heed the warnings and strictly follow safety procedures.

⚠WARNING :This symbol signifies that improper usage may result in injuries.

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

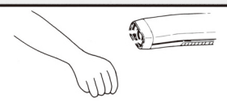
⃠ : This symbol signifies a prohibited action.
❗ : This symbol signifies a required action.

⚠WARNING



Do not use PT-3S to measure temperature of such targets of high voltage. This is to avoid an electric shock.

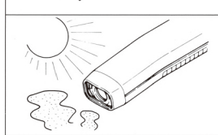
⚠CAUTION



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

Environmental Condition to use

⃠ **KEEP THE THERMOMETER AWAY FROM DROPPING WATER AND DO NOT USE IN WATER.**
This thermometer is not water-proof.



❗ **KEEP THE THERMOMETER AWAY FROM DIRECT SUNLIGHT, DUST, HIGH TEMPERATURES AND HIGH HUMIDITY DURING USE AND STORAGE.**
Otherwise, the optical lens will become dirty or damaged. Such usage or storage will result in incorrect measurements.

❗ **DO NOT APPLY SUDDEN TEMPERATURE CHANGES TO THE THERMOMETER.**
Sudden temperature changes may cause incorrect measuring results. In such cases, leave the thermometer for a moment to let it return to a stable condition prior to the next measurement.

❗ **KEEP THE THERMOMETER AWAY FROM PRODUCTS WHICH PRODUCE STRONG ELECTROMAGNETIC WAVES.**
Usage in such environments will cause irreparable damages to the unit and incorrect measurements.

Operation instructions

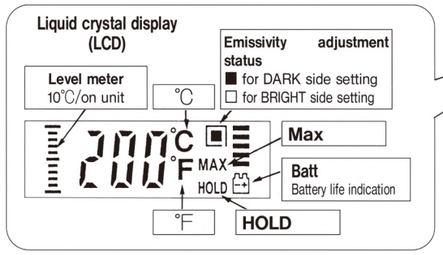
1. Set batteries correctly into the battery box which is located at the rear side of thermometer.

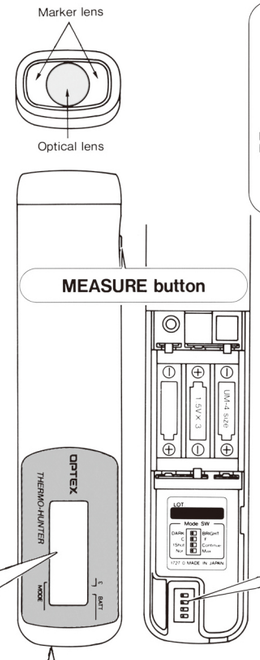
●Operation①(1 Shot mode)

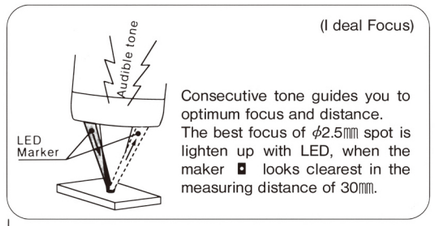
2. The thermometer is turned on and starts measuring by keeping a MEASURE button depressed. Bring PT-3S close to the object. Then consecutive "Focussing tone" comes up to let you know the measument is correct. Then the best focus of ϕ2.5㎜ spot is pointed up with LED when the marker is visible clear and smallest at the measuring distance of 30㎜ (approximately).
3. A finally measured value (Normal Mode) or a maximum value (MAX mode) can be held on the display for ten(10) seconds when you release a MEASURE button then the power is turned off automatically. (MAX or NORMAL mode can be selected by the DIP switch.)

●Operation②(Continuous mode)

2. This mode is ideal for continuous monitoring without pressing the MEASURE button. Press the MEASURE button to turn on, then the display is given continously as well as analog output comes.
3. It operates same as "1 shot mode" does, as long as the MEASURE button is depressed.
4. To end the measurement, return the measuring mode to "1Shot". Power goes off after the display is held around ten seconds.







DIP switch setting

●DARK／BRIGHT : This is to change the emissivity mode. Set this switch in accordance with the emissivity (ε) of measuring objects.
DARK……Emissivity is set to blackish objects. (nominal 0.95)
BRIGHT…Emissivity is set to whitish objects. (nominal 0.70)

●℃／℉…This is to change a temperature unit.

●1Shot／Continue : This is to change a measuring mode.
1Shot ……Normal measuring mode is set.
Continue…Continuous measuring mode is set.

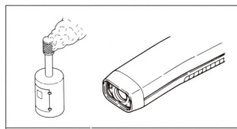
●Nor／Max :Select the display to hold ;
Nor ……The temperature before your releasing a MEASURE button.
Max……The highest temperature during the measurements.

The initial setting of DIP switches is DARK,℃, 1Shot, Nor. (left sides all). Change the DIP switch setting depending on your purpose of use.

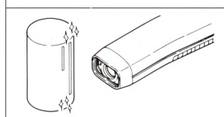
Analog output terminal

Analog output terminal gives 1mv/℃ output. Use the exclusive analogue cable (ϕ2.5) attached

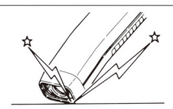
Cautions on usage



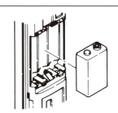
❗ **Never bring PT-3S close to the target with hich temperature nor aim the wider area than the field of view specified.**
PT-3S is for measurement of temperature of small targets. Incorrect measurements will occur.



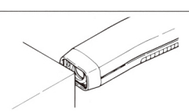
❗ **AVOID MEASURING SHINY OBJECTS.**
Shiny objects reflect surrounding temperatures. Although the emissivity rate of the unit can be adjusted to compensate for this problem, incorrect measurements will still result.



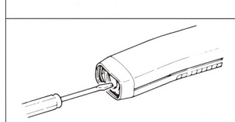
⃠ **DO NOT DROP THE THERMOMETER OR APPLY VIOLENT SHOCKS.**
Otherwise, irreparable damages or incorrect measurements will result.



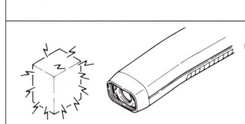
⃠ **DO NOT USE WITH NON-STANDARD VOLTAGE.**
Using the unit with currents outide the 12～24 voltage range may result in damage to the unit, shorts, fires and injuries. In such cases, immediately switch the unit off.



⃠ **DO NOT TOUCH TO THE OBJECT THAT IS BEING MEASURED.**
The unit is a non-contact thermometer. Touching the unit to objects with high temperatures will result in irreparable damages in the shape of the unit and incorrect measurements.

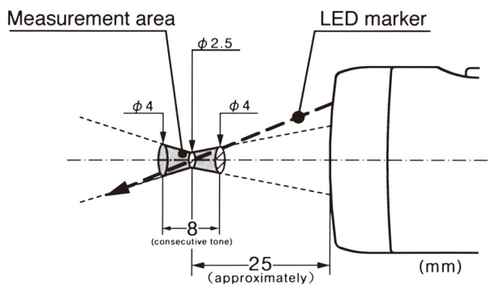


⃠ **DO NOT TOUCH THE LENS.**
Do not touch the lens with hard or sharp objects. Do not insert foreign objects into the light receiving part. Otherwise, damage to the lens or incorrect measurements will occur.



❗ **DO NOT USE NEAR OBJECTS ELECTRICALLY CHARGED.**
Otherwise, irreparable damages or incorrect measurements will result.

Field of View



The measurement area depends upon 90% energy limit of optical responce. The object size should be larger than the above area. The maximum spot size is ϕ4㎜ in the above measuring area.

Trouble shooting

Problem	Cause	Action
No display	No battery or wrong setting of batteries.	Replace batteries or set batteries again in correct direction.
The measured value seemes incorrect.	Optical lens becomes dirty.	Clean up an optical lens referring to the maintenance clause of this document.
	The measured area is disaligned.	Target the spot maker at the center of the area.
	The object is with lustrous metallic surface.	Reading error is inevitable by this model. Use another model(x-400)
The measured value is unstable.	The unit is affected by rapid of environmental temperature change.	Leave the unit for some time until the display temperature becomes stable.
Focussing guide is not audible	The marker lens becomes contaminated.	Clean up an optical lens refferring to the maintenance clause of this document.
	The view field is blocked	Remove an obstruction.

In case of no recovery from the symptom even if you take the above actions, there is a possibility of some defects with the thermometer. In this case, please contact your local dealer for service.

Maintenance

Optical Lens Dust, dirt and scratches on the optical lens cause incorrect measurements. In case of dirty lenses, please remove the dust on the lens with a blower, etc. for lens cleaning use. If the dust or dirt can not be removed with a blower, lightly wipe the lens with a cotton swab or special lens cleaning cloth.

Main Unit The main unit is made of PBT and polycarbonate. When it becomes dirty, lightly wipe with a soft cloth which haws been soaked in soapy neutral water and then well wrung. Do not apply chemical solvents such as thinner, benzine and alcohol to remove the dirt since these chemicals may cause erosion of the casing surface, or disappearance of printed characters.

Check We recommend that you check the temperature reading once a year. Please inquire at your local dealer for service.

Batteries

1) Battery box is located on the back of the thermometer. Slightly push and slide the battery box cover so that it can be taken off.
2) Set the batteries into the battery box in the correct direction according to the polarity marks in the box.

Replace the batteries when the battery life indicator starts blinking. Replace both batteries with new ones to avoid using old and new batteries together.

Caution

1) Do not throw used batterise into a fire. Do not recharge them.
2) Follow the local laws or regulations when disposing the batteries.
3) Take the batteries out of the thermometer when you do not use it for a long time.

Reference

○Emissivity ratio (ε)

The emissivity ratio is the rate of the energy emitted from the surface of the object. All objects possess a particular emissivity ratio which changes according to the object's surface conditions or temperature. Our thermometer allows the emissivity ratio to be set at a fixed rate, enabling the surface temperatures of the following objects to be almost precisely measured :

0.95 (DARK) …rubber, plastic, paper, food, painted surfaces, etc.
0.70 (BRIGHT) …oxidized metallic surfaces, etc. can be measured correctly.

In the case of objects with different emissivity ratios than the objects listed above, discrepancies in measurement will occur. In such cases, take other measured figures as approximate values.

By placing our separately sold black tape (=0.95) onto the object to be measured, the object can be almost precisely measured. (～150° C)

Specifications

Model	PT-3S
Temperature Measuring Range	0～200° C(display range—30～230° C)
Field of View	ϕ2.5／25mm
Optics	Silicon lens
Detection Element/Wavelength	Thermopile／8～14μm
Response Time	1.5s／90%
Accuracy	±3° C of reading (ε=0.95)
Repeatability	±1° C of reading value
Display Resolution	0～200° C : 0.1° C／0.2° F(～0° C,200° C～ : 1° C／° F)
Sighting Method	Red LED spot marker
Emissivity ratio (ε) Adjustment	DARK／BRIGHT (Switchable)
Temperature Unit	° C／° F (Switchable)
Measuring Mode	NORMAL／MAX (Switchable)
Power supply	UM-4 dry cell × 3pcs
Battery Life	Approx. 40 hours with Alkaline Battery
Ambient Temperature	0～50° C
Ambient Humidity	35～85%RH (without dew condensation)
Storage Temperature	—20～70° C
Dimensions	H×W×D=175×38×25.5mm
Weight	120g (including batteries)

Standard accessories : UM-4 Alkaline dry cell × 3pcs
Analog output cable × 1, Pouch × 1
Optional sccessories : black tape

Specifications are subject to change for product improvement without prior notice.

Portable Non-Contact Thermometer

Instruction Manual

THERMO-HUNTER *PT-S80/U80*

OPTEX FA CO.,LTD
91 Chudoji-Awata-cho Shimogyo-ku Kyoto 600-8815 JAPAN
TEL: +81-75-325-1314 FAX: +81-75-325-2936

Printed in JAPAN 0807000 2018/5

Thank you very much for purchasing this 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.

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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-S80/U80 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 changes of measurement,arising from accident, misuse or abnormal conditions of operation or handling.**

Conformance to EU Directives

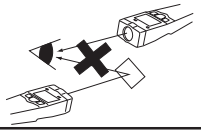
- This in a class A product. In residential areas it may cause radio interference, in which case the user may be required to take adequate measures to reduce interference.

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.

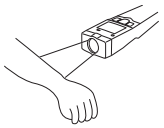
⚠Caution : This symbol signifies that improper usage may result in injuries or damage.

⚠ 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



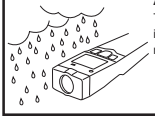
This product is not a clinical thermometer and therefore, can not be used for medical purposes.

⚠ CAUTION

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

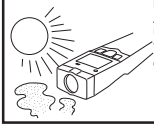
Safe Usage _ Environmental warnings/Cautions

Environmental Warnings ⃠ — Warning ❗ — Caution



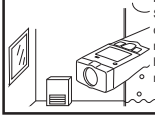
KEEP THE THERMOMETER AWAY FROM DROPPING WATER AND DO NOT USE IN WATER.

This thermometer is not waterproofing. Usage in such environments may cause irreparable damages.



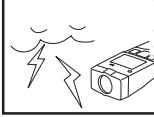
KEEP THE THERMOMETER AWAY FROM DIRECT SUNLIGHT, DUST,HIGH TEMPERATURES AND HIGH HUMIDITY DURING USE AND STORAGE.

This may cause irreparable damage or incorrect measurement.



KEEP THE THERMOMETER AWAY FROM SUDDEN CHANGE IN AMBIENT TEMPERATURE.

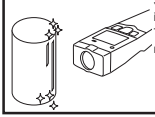
Sudden temperature change may cause incorrect measurement. Start measurement when temperature has become stable after leaving the meter for a while.



KEEP THE THERMOMETER AWAY FROM STRONG ELECTROMAGNETIC SOURCES.

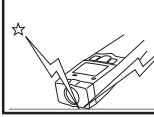
Usage in such environments may cause irreparable damage or incorrect measurement.

Usage Warnings ⃠ — Warning ❗ — Caution

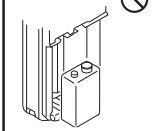


AVOID MEASURING SHINY OBJECTS.

Shiny objects reflect surrounding infrared energy.
Therefore, it results in incorrect measurement.

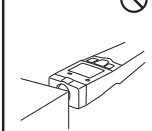


DO NOT DROP THIS THERMOMETER NOR GIVE A STRONG IMPACT TO IT, WHICH MAY CAUSE IRREPARABLE DAMAGE OR INCORRECT MEASUREMENT.



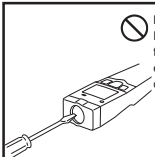
USE THE SPECIFIED BATTERIES.

Use of the other batteries may cause irreparable damage or incorrect measurement.



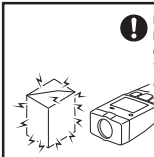
DO NOT LET THE THERMOMETER TOUCH THE OBJECT THAT IS BEING MEASURED.

This product is a non-contact thermometer. Touching high-temperature object may cause deformation of the meter, irreparable damage or incorrect measurement.



DO NOT TOUCH THE FILTER.

Do not let a solid or sharp object touch the filter and do not insert foreign objects into the filter. These may cause incorrect measurement.



DO NOT BRING THE THERMOMETER CLOSE TO ELECTRICALLY CHARGED OBJECTS.

This may cause irreparable damage or incorrect measurement.

Specifications

Model	PT-S80	PT-U80
Measuring range	-30 to 600°C	
Field of view	□30/1000mm (D:S=33:1)	
Optics	Si lens	
Sensing element	Thermopile	
Wavelength	8 to 14 μm	
Response time	0.5sec. / 90%	
Accuracy (ε≒ 0.95)	-30.0 to 0°C : ±3°C, 0.1 to 200°C : ±2°C, 200 to 600°C : ±1% of reading value	
Repeatability	±1°C of reading value	
Display resolution	-30.0 to 199.9°C : 0.1°C, 200 to 600°C : 1°C ※1	
Sighting method	Coaxial laser marker (Class 2)	
HOLD time	15 seconds	
Continuous measurement mode	–	ON / OFF Selectable
USB output	–	○
Memory	1-point memory	35-point memory
High/Low Alarm LED/Buzzer	Alarm LED/Buzzer ON/OFF Selectable	
Emissivity (ε) Adjustment	0.95/0.85/0.70 Selectable	ε Adjustable (0.30 to 1.20/0.01step)
Temperature unit	°C / °F (Selectable)	
Display function	NOR / MAX / MIN	
Power supply	AA Battery x2pcs.	
Battery life	15 Hours (with max load)	
Ambient temperature	0 to 50°C	
Ambient humidity	35% to 85%Rh (Without due condensation)	
Storage temperature/humidity	-10 to 60°C/35% to 85% Rh	
Material	ABS/TEEE	
Dimension	H x W x D = 182 x 56 x 38 mm	
Weight	Approx. 250g (Including batteries)	
Applicable regulations	EMC Directive (2014/30/EU),RoHS Directive (2011/65/EU),China RoHS (MIIT Order No.32) FDA (21 CFR 1040.10 and 1040.11) (expect for deviations pursuant to Laser Notice No.50) Consumer product safety Act.(PSC Mark)	
Applicable standards	EN 61326-1:2013, IEC 60825-1:2007,2014	

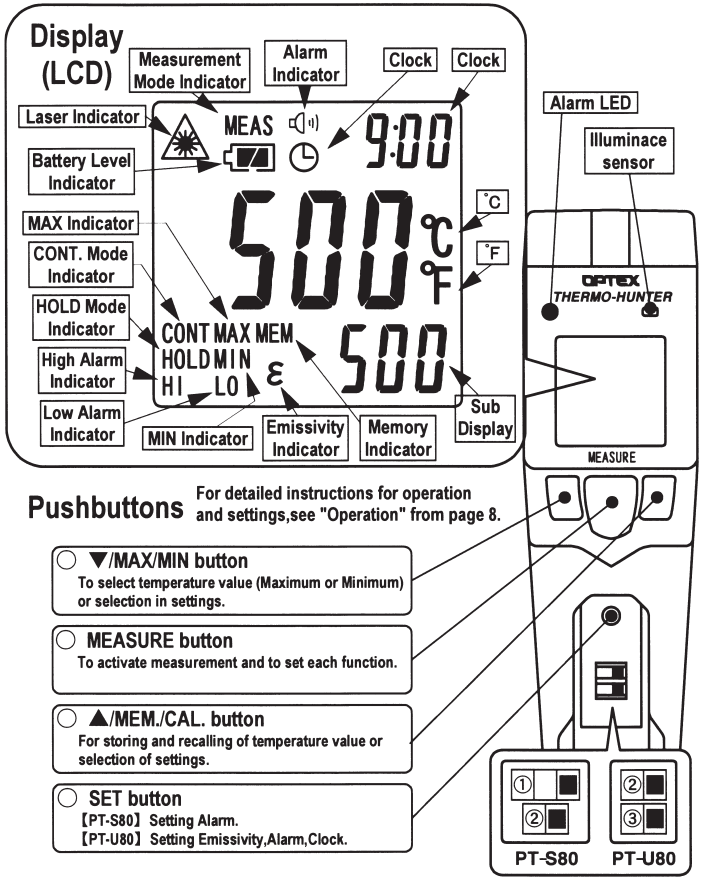
※1 The measurement accuracy in the specification is limited to the calibration conditions of our factory.

Accessories : AA battery x 2pcs. (for checking operations), Instruction manual (this document)
exclusive protective case, USB cable (Only for PT-U80)

Optional : Blackbody tape

For China RoHS, please refer to http://www.optex-fa.com/rohs_cn/

Name of Components

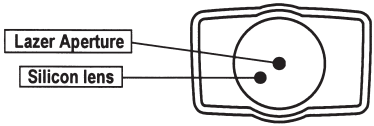


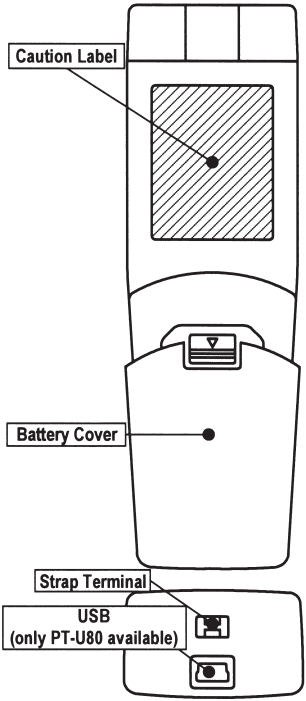
Pushbuttons

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

- ○ **▼/MAX/MIN button**
  To select temperature value (Maximum or Minimum) or selection in settings.
- ○ **MEASURE button**
  To activate measurement and to set each function.
- ○ **▲/MEM./CAL. button**
  For storing and recalling of temperature value or selection of settings.
- ○ **SET button**
  【PT-S80】 Setting Alarm.
  【PT-U80】 Setting Emissivity,Alarm,Clock.

* There is no button to turn ON/OFF the supper supply.





DIP switches

1. 0.95 / 0.85 / 0.7
Setting Emissivity to fit objects surface.

2.˚C / ˚F
Setting display units (˚C / ˚F).

3. NOR. / CONT.
Selecting NOR.(Normal Mode) or CONT. (Continuous Mode).

Operation

Temperature can be measured while the (MEASURE) button is being pressed.
Set the batteries supplied as an accessory and operate the unit according to the following procedure.

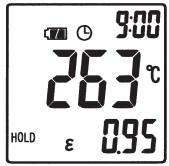
1

Pressing the (MEASURE) button to turns ON the power supply. A laser beam emitted and the measurement starts.
In the Normal Measurement mode, the units takes measurement while (MEASURE) button is pressed.

2

Point the laser beam at a measurement 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 page10.

3



When the (MEASURE) button is released, the **"MEAS"** and laser beam symbols go out and **"HOLD"** and **"C (°F)"** symbols light up. After the last temperature value is displayed for 15seconds (HOLD mode), the power is automatically turned OFF.

Selection of display function

Each time the (▼/MAX/MIN) button is pressed, the display function is switched in order of NOR., MAX, and MIN.

NOR. :**"** ε **"** is displayed at the bottom of LCD and the currently set emissivity is displayed on the sub-display.
MAX: **"MAX"** is displayed at the bottom of LCD and the maximum value during measurement is displayed on the sub-display.
MIN: **"MIN"** is displayed at the bottom of LCD and the minimum value during measurement is displayed on the sub-display.

Selection of temperature unit

Selection the temperature unit (°C or °F) referring to the **"**DIP switch setting**"** in page 7.

*The temperature unit is automatically switched with regard to the temperature displayed in the HOLD mode, display function, setting values for upper/lower temperature alarms, and recorded data.

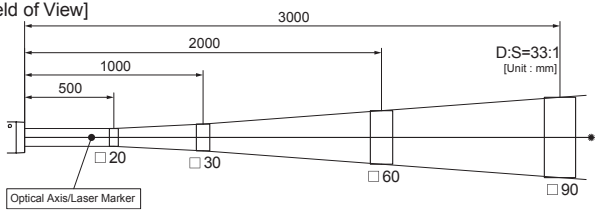
Default value for each setting (at the time of shipment)

	PT-S80	PT-U80
Temperature unit	°C	
Display function	NOR.	
Maximum temperature alarm	Temperature setting : 600°C Function : OFF	
Minimum temperature alarm	Temperature setting : -30°C Function : OFF	
Emissivity (ε)	0.95	
Memory	Nothing	
Continuous measurement mode	–	OFF

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**

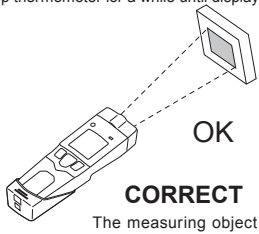
ex.) The average temperature of surface of the square 90mm in diameter is measured at a distance of 3000mm away from the measuring object.

* The laser beam points 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 1,000mm or more away from the measuring object, unless there is any obstacle. However, please note that the measuring field of view depends on measuring distance. This thermometer has an optical resolution of 33:1 [D(Distance to the measuring object):S(Spot size)].

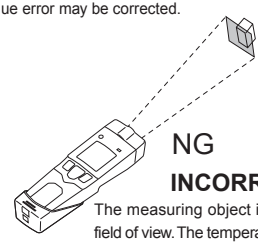
[For Correct Measurement]

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.
Please keep away from target as far as you can within spot ratio when you measure high temperature.
Sudden ambient temperature change may cause thermometer display value error. In this case, please keep thermometer for a while until display value error may be corrected.



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 the measuring value.

Setting/Resetting the High/Low Temperature Alarm

When the measured temperature of the object exceeds the High alarm value, the alarm LED blinks in red and a buzzer (high tone) sounds. When it is below the Low alarm value, the alarm LED blinks in green and a buzzer (low tone) sounds. The “High alarm” is set up first, and then the “Low alarm”.
Set up the alarms according to the following steps.

1

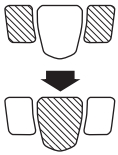
Press the (SET) button while the power is ON.

Pressing the (SET) button displays **“ALM”** on the top of **LCD**.
(Regarding PT-U80, the display is switched in order of **“ALM”**, **“EMS”** and **“TIME”** each time the (SET) button is pressed.)

2

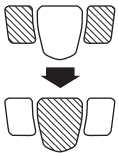
Pressing the (MEASURE) button blinks **“ALM”**. Then, **“ON”** or **“OFF”** (currently set status) is displayed on the top of LCD and **“AL-H”** is displayed on the sub-display. (The High alarm is set up.)

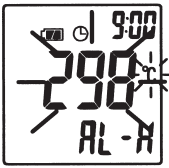
3



Press the (▼/MAX/MIN) or (▲/MAX/MIN) button to select ON or OFF, and then press the (MEASURE) button to confirm the setting.
When OFF is selected, the display shifts to the setting for the lower limit temperature alarm.

4





The alarm temperature is displayed on the top of LCD by selecting ON.
Press the (▼/MAX/MIN) or (▲/MAX/MIN) button to select ON or OFF, and then press the (MEASURE) button to confirm the setting.
When the setting has been completed, the display shifts to the setting for the Low temperature alarm.

For the setting/resetting of the lower limit temperature alarm, the above steps can be applied excluding that **“AL-H”** on the sub-display is changed to **“AL-L”** in step 2 and later.
When the lower limit setting has been completed, the mode is changed to HOLD.
When the upper and lower limit alarms are set, **“HI”** and **“LO”** lamps are lit on the display.

Note) The upper limit temperature cannot be set to the value less than the setting for the lower limit temperature alarm, and the lower limit temperature cannot be set to the value more than the setting for the upper limit temperature alarm.

PT-S80

■ P.13 Recording Measured Temperature

□ Record Measured Temperature (MEM.Mode)

□ *Call* Temperature Record (CALL Mode)

■ P.13 Emissivity Setting

Recording Measured Temperature

PT-S80 can store one (1) temperature measurement data.
Perform the following steps.

[Record measured temperature/ MEM. mode]

1

1 Press this button for 2 seconds or more while the power is ON.

After **"CALL"** is displayed on the sub-display, **"MEM"** blinks on the display and the temperature value that had been displayed on the sub-display when the (▲/MEM./CAL) button was pressed starts to light up. Then the value is stored in memory.
After the data is stored, the mode is changed to HOLD.

[Call temperature record/CALL mode]

1

1 Press this button for less than 2 seconds while the power is ON.

"CALL" is displayed on the sub-display, and then the stored temperature data displayed.

2

Press the (MEASURE) button to terminate the CALL mode. Then, the normal measurement mode is restored.

Emissivity Setting

Emissivity (ε) refers to the ratio of infrared energy emitted from all the object surfaces. All objects has their own emissivity, which changes depending on the surface conditions and object temperature. This thermometer has 3 fixed emissivities. Refer to the following examples.
0.95...Food, rubber, plastic, paintwork, etc.
0.85...Temperature of refrigerated food can be measured almost accurately.
0.70...Temperature of oxidized metal surfaces can be measured almost accurately.
The displayed temperature could differ from the actual temperature of objects that have different emissivity. In such cases, regard the displayed temperature as a rough standard. When you wish to measure shiny metal surfaces, put a piece of optional blackbody tape (ε =0.95) on the surface of the measured object.

When the emissivity (0.95/0.85/0.7) is selected according to "DIP switch setting" in page 7, the temperature value converted into the selected emissivity is displayed.

PT-U80

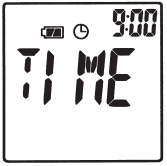
- P.15 Date and Time Setting
- P.17 Emissivity Setting
- P.18 Recording Measured Temperature
  - Record Measured Temperature (MEM.Mode)
  - Call Temperature Record (CALL Mode)
  - Delete All the Temperature Records
- P.19 Continuous Measurement
- P.20 USB Connection

Date and Time Setting

Date and time can be set in PT-U80.
Perform the following steps.
*The setting returns to the default if batteries are removed.

1

Press this button while the power is ON.

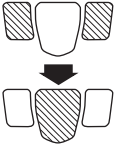


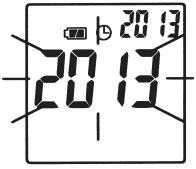
The LCD display is switched in order of "**ALM**", "**EMS**" and "**TIME**" each time the (SET) button is pressed. Display "**TIME**" on the LCD.

2

After "**TIME**" blinks, "**YEAR**" blinks. Then, the display is automatically shifted to the state that "**YEAR**" lights up and the dominical year blinks.

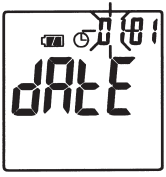
3





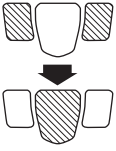
Press the (▼/MAX/MIN) or (▲ /MEM./CAL.) button to adjust the year. Then press the (MEASURE) button to fix the setting.
After the setting, the set year blinks on the LCD.

4



After the set year blinks, "**date**" blinks, then the display is automatically shifted to the state that "**date**" lights up, the left 2 digits of the clock (month) blinks and the right 2 digits (day) lights up.
The left 2 digits of the clock indicate a "month" and the right 2 digits indicate a "day".

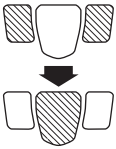
5

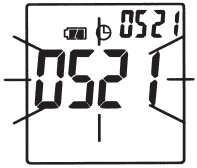


Press the (▼/MAX/MIN) or (▲ /MEM./CAL) button to adjust the month. Then press the (MEASURE) button to fix the setting.
After the setting, the right 2 digits of the clock blink. Then go to the "date" setting.

To the page that follows

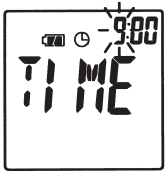
6





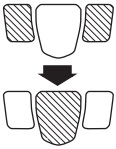
Press the (▼/MAX/MIN) or (▲/MEM./CAL.) button to adjust the month. Then press the (MEASURE) button to fix the setting.
After the setting, the set month and date blink on LCD.

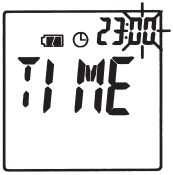
7



After the set date blinks, "TIME" blinks, and then the display is changed to the state that the time lights up, the left 2 digits of the clock (hour) blinks and the right 2 digits (minute) light up.

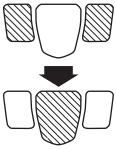
8





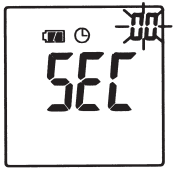
Press the (▼/MAX/MIN) or (▲/MEM.CAL.) button to adjust the hour. Then press the (MEASURE) button to fix the setting.
After the setting, the right 2 digits of the clock start to blink for the "minute" setting.

9



Press the (▼/MAX/MIN) or (▲/MEM.CAL.) button to adjust the hour. Then press the (MEASURE) button to fix the setting.
Then, the set time blinks on LCD.

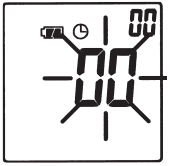
10



After the set time blinks, "SEC" start to blink and then the display is automatically changed to the state that "SEC" lights up and the "00" blinks on the clock.

To the page that follows

11



When the (MEASURE) button is pressed, the second is set to 0. Press the button so that the second is accurately set. The date and time setting is now complete. After "00" blinks on LCD, the mode is switched to HOLD.

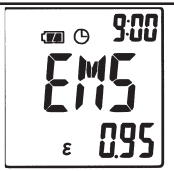
Emissivity Setting

Emissivity setting
Emissivity (ε) refers to the ratio of infrared energy emitted from all the object surfaces. All objects has their own emissivity, which changes depending on the surface conditions and object temperature. The emissivity setting for this thermometer can be changed, so that emissivity can correspond to a measured object and more accurate values can be measured.
Objects with low emissivity (ex: shiny metal surfaces) reflect the surrounding temperatures due to the high reflectivity. If an object other than the measured object such as a high-temperature object exists on the periphery, temperature for the other object is reflected, which will cause incorrect measurement. Thus, it is necessary to block off the obstacle.
Although the maximum emissivity is primarily 1.00, the value up to 1.20 can be set for this thermometer in consideration of convenience.

1

SET

1 Press this button while the power is ON.

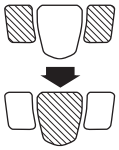


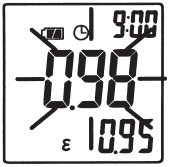
The LCD display is switched in order of **"ALM"**, **"EMS"** and **"TIME"** each time the (SET) button is pressed. Display **"EMS"** on the LCD. (The currently set emissivity is displayed on the sub-display.)

2

After **"EMS"** blinks, the currently set emissivity appears on LCD. (The currently set emissivity is displayed on the sub-display.)

3





Press the (▼/MAX/MIN) or (▲/MEM./CAL) button to display the emissivity to be set up. The setting is completed by pressing the (MEASURE) button.
After the setting, the mode is changed to HOLD.

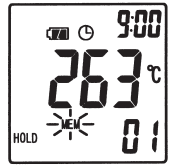
Recording Measurement Temperature

PT-U80 can store 35 temperature measurement data.
Perform the following steps.

[Record measured temperature/ MEM. mode]

1

1 Press this button for 2 seconds or more while the power is ON.



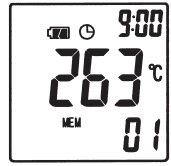
After **"CALL"** is displayed on the sub-display, **"MEM"** blinks on the display and a memory No. lights up on the sub-display. Then the temperature value that had been displayed when the (▲/MEM./CAL) button was pressed is stored in memory.
After the data is stored, the mode is changed to HOLD.

*If the number of stored data has exceeded the capacity, **"FULL"** lights up on LCD.

[Call temperature record/CALL mode]

1

1 Press this button for less than 2 seconds while the power is ON.



"CALL" is displayed on the sub-display, and then the latest stored temperature data and the corresponding memory No. are displayed.
*Data cannot be called during the continuous measurement mode.

2

When the memory No. is changed, the corresponding temperature data is displayed in order.

3

Press the (MEASURE) button to terminate the CALL mode. Then, the normal measurement mode is restored.

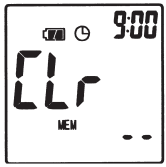
To the page that follows

[Delete all the temperature records]

1

SET

Press the (SET) button during the CALL mode.

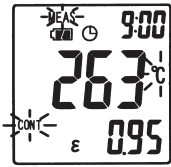


"CLR" is displayed on LCD, and all the temperature records are deleted. After the deletion, the HOLD mode is restored.

Continuous Measurement

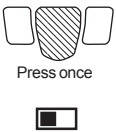
For PT-U80, continuous measurement can be performed without pressing the (MEASURE) button. Perform the following steps.

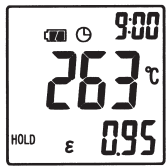
1



When the (MEASURE) button is pressed while the DIP switch is adjusted to the CONT. side (Refer to "DIP switch setting" in page 7.), **"CONT"** is lit on LCD and continuous measurement is started. Measurement continues even if releasing the (MEASURE) button.

2





When the (MEASURE) button is pressed again or the DIP switch is changed over to the NOR. side, the mode is changed to HOLD.

*Laser beam is not radiated during the continuous measurement mode.

USB Connection

PT-U80 is connectable to PC with the exclusive software and included USB cable. The exclusive software is downloadable at following Web address.

URL http://www.optex-fa.com/download/products/pt_80/

<< Adaptable hardware >>

The exclusive software activates on DOS/V PC with USB connector and installed Windows 2000 or XP. USB Rev11.

Note: Mac OS is not acceptable.
See the URL above for detail.

Connection

1: Download and install the exclusive software into PC.
Please make sure the PT-U80 turns off when connecting PC.Otherwise stored data is deleted.
2: Connect USB cable to PC.
3: Set up the exclusive software.
4: Push MEASURE switch on thermometer.
USB cable provides power to thermometer in connecting.

The outlook of exclusive software

1: Software is capable of reading, revising and writing of data inside thermometer.
2: PC can read all date instantly on thermometers continuous mode.
3: Output all data by CSV format.
4: Set up each parameters.
Clock
Emissivity
Change memory capability

For the details, please see the exclusive software.

Shut down

1: Finish the exclusive software.
2: Disconnect USB cable from PC with PO indication.
3: Disconnect USB cable from thermometer.

Troubleshooting

Symptom	Cause	Countermeasure
Display does not appear.	The batteries have been exhausted. Battery installation is incorrect.	Replace the batteries. Re-install the batteries correctly.
Laser beam is not radiated. (*Laser beam is not radiated during the continuous measurement mode.)	The laser ejection exit is dirty.	Clean the laser ejection exit according to the“Body”in “Maintenance method ” in page 22.
	Voltage necessary for lighting up laser beam is not satisfied.	Replace the batteries, (The -b- symbol blinks.) or re-install the batteries correctly.
Measured value are unusual.	The lens section is dirty.	Clean the filter referring to the“Lens” in “Maintenance method” of page 22.
	The sight is out of the range.	Locate the optical axis on the center of an object to be measured referring to the“Field of view”in page 10.
	The measured object is smaller than the field of view.	Adjust the measuring distance referring to the “Field of view” in page 10.
	The measured object is adjacent to a high-temperature object and subjected to heat.	Cut off the heat sources with a shield or such.
Measured value are unstable.	A shiny metal surface is being measured.	This thermometer causes an error when measuring a shiny metal surface. Perform measurement after putting optional blackbody tape onto the object.
	The thermometer is being subject to sudden temperature change.	Set aside the thermometer until the temperature becomes stable.

When the above symptoms are not removed even after the corresponding countermeasure has been taken, the thermometer may have a fault. In such cases, contact the shop in which you purchased the product or OPTEX FA.

Maintenance method

[Lens]

Dust or dirt adhering to the lens and flaws on the lens may cause incorrect measurement. When the lens is dirty, remove the adhering objects from the lens using a blower for lens cleaning, etc. If dirt remains, wipe the lens softly using a cotton swab or lens wiping cloth moistened with a small amount of ethyl alcohol.

[Body]

Wipe it with a soft cloth.
When the body is extremely dirty, wipe it with a cloth moistened with diluted detergent after wrung sufficiently.
Note) Do not use hot water exceeding 50°C and chemical agents such as thinner and benzene, which may cause fading of characters, deformation, or damage.

[Periodical inspection]

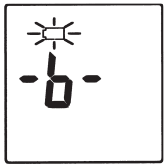
It is advisable to perform an annual calibration inspection. For further information, please contact OPTEX FA.

Battery

[Battery replacement]

When the BATT. symbol as a battery indicator and "-b-" on the display have started to blink, it is time to replace the batteries.
Note)When replacing the batteries, be sure to install new batteries without mixing an old one.

(1) Seize it lightly face and back of the battery cover by hand, and pull it out.
*A battery cover is the structure which doesn't come off easily to prevent falling.
(2) Install new batteries in the correct direction.



*The attached batteries are to be used for checking operations. The battery life mentioned in Specifications is not assured for these batteries.

Precautions when handling batteries

- Do not throw exhausted batteries in the fire, nor charge them.
- Do not dispose of exhausted batteries together with general waste. Take them to an appliance dealer or dispose of them when permitted.
- Remove batteries when the thermometer is not used for a long term.